

DOCUMENT RESUME

ED 196 643

SE 030 955

TITLE Las Matematicas: Lenguaje Universal. Grados Intermedios, Niveles 1-3. Teacher's Guide I (Mathematics: A Universal Language. Intermediate Grades, Level 1-3. Teacher's Guide I).

INSTITUTION Dissemination and Assessment Center for Bilingual Education, Austin, Tex.; Fort Worth Independent School District, Tex. Bilingual Education Program.

SPONS AGENCY Office of Education (DHEW), Washington, D.C.

PUB DATE 79

NOTE 263p.; For related documents, see SE 030 950-962. Not available in hard copy due to copyright restrictions. Pages 79-94 missing from document prior to its being shipped to EDRS for filming.

AVAILABLE FROM Dissemination and Assessment Center for Bilingual Education, 7703 North Lamar Blvd., Austin, TX 78752 (\$5.00).

LANGUAGE English; Spanish

EDRS PRICE MF01 Plus Postage. PC Not Available from EDRS.

DESCRIPTORS Addition; *Bilingual Education; Division; *Elementary School Mathematics; Elementary Secondary Education; Mathematics Curriculum; *Mathematics Instruction; Measurement; Multiplication; Number Concepts; Secondary School Mathematics; Spanish Culture; *Spanish Speaking; Subtraction; *Teaching Guides; Teaching Methods

IDENTIFIERS Bilingual Materials

ABSTRACT

This guide covers the first part of a bilingual, sequential mathematics course. The course integrates culturally relevant situations and illustrations with mathematics to reinforce the student's self-concept and encourage cultural pride. This program may be used as a self-contained continuum, as a supplement to another course of study, for individualized instruction, or in the large-group, traditional classroom. These materials are written in English and Spanish for grades 6-8, but may be used for other grade levels. The guide includes suggestions on grouping, presentations, goal setting, scheduling, a testing center, a mathematics laboratory, assignment of materials, and grading. Also included are an overview, behavioral objectives, patterns for duplicating masters or transparencies and patterns for materials to be used in suggested activities. The mathematical topics covered in this guide include numeration, addition, subtraction, multiplication, division, and measurement. (Author/MK)

* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *

LAS MATEMÁTICAS: LENGUAJE UNIVERSAL

Grados Intermedios
Niveles 1-3

TEACHER'S GUIDE I

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY.

"PERMISSION TO REPRODUCE THIS MATERIAL IN MICROFICHE ONLY HAS BEEN GRANTED BY

Elsa Sanchez-de-la-Vega

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."



ED196643

SE 030 955

Grados Intermedios

Niveles 1-3

LAS MATEMÁTICAS: LENGUAJE UNIVERSAL

TEACHER'S GUIDE I

Publicado por:

Elaborado por:



3



agUILA volante SERIES

BILINGUAL MATERIALS DEVELOPMENT CENTER

**Dissemination and Assessment Center
for Bilingual Education
Education Service Center, Region XIII
7703 North Lamar
Austin, Texas 78752**

"The project reported herein was performed pursuant to a Grant from the U.S. Office of Education, Department of Health, Education and Welfare. However, the opinions expressed herein do not necessarily reflect the positions or policy of the U.S. Office of Education, and no official endorsement by the U.S. Office of Education should be inferred."

The Dissemination and Assessment Center for Bilingual Education is a special E.S.E.A. bilingual project funded by the U.S. Office of Education through the Education Service Center, Region XIII. DACBE has selected these materials for dissemination, however, the opinions expressed herein do not necessarily reflect its position or policy nor that of Education Service Center, XIII.

This publication was developed and printed with funds provided by the Bilingual Education Act, Title VII of the Elementary and Secondary Education Act of 1965, as amended by Public Law 93.380.

**© Fort Worth Independent School District
Fort Worth, Texas
All Rights Reserved
1978**

ISBN-89417-582-3

**First Printing October 1978
Reprinted 1979**

TABLE OF CONTENTS

FOREWORD.....	ix
ACKNOWLEDGEMENTS.....	xi
INTRODUCTION.....	1
NIVEL 1: NÚMEROS Y NUMERACIÓN	
Overview.....	15
Behavioral Objectives.....	15
Contrastive Features.....	16
Lesson 1-1: The Set, Number, and Numeral.....	18
Lesson 1-2: Graphing on a Number Line.....	21
Lesson 1-3: Place Value.....	23
Lesson 1-4: Using Exponents.....	26
Lesson 1-5: Expanded Notation.....	27
Lesson 1-6: Flow Charts.....	28
Lesson 1-7: Rounding Numerals.....	29
Lesson 1-8: Roman Numerals.....	31
Answer Keys: Student Booklet, Patterns and Activities, Tests.....	35
Patterns and Activities.....	59
Tests.....	81
NIVEL 2A: SUMA Y RESTA DE NÚMEROS ENTEROS	
Overview.....	91
Behavioral Objectives (Levels 2A, 2B, 2C).....	91
Contrastive Features.....	92

Lessons 2A-1, 2A-2.....	96
Definitions Beginning Addition	
Lessons 2A-3, 2A-4.....	97
Adding More Numbers (Associative Property) Adding Several Numbers	
Lessons 2A-5, 2A-6a, 2A-7.....	100
Adding By Regrouping (Carrying) Some Helpful Hints More Practice	
Lesson 2A-6b: Some Helpful Hints (Approximation).....	103
Lessons 2A-8, 2A-9, 2A-10.....	105
Finding Missing Addends Subtraction Facts With Practice Subtraction Problems With Larger Numbers	
Lesson 2A-11: Subtracting By Regrouping (Borrowing).....	108
Lesson 2A-12: How About a Zero?.....	113
Lesson 2A-13: Practice.....	116
NIVEL 2B: MULTIPLICACIÓN Y DIVISIÓN DE NÚMEROS ENTEROS	
Overview.....	119
Behavioral Objectives (See Level 2A).....	91
Introduction to Lesson 2B: 1 (Plan A).....	119
Lesson 2B-1:(Plan A): Products and Factors.....	120
Lessons 2B-1, 2B-3, 2B-4 (Plan B).....	122
Products and Factors Multiplying With Larger Numbers Multiplying by One-Digit Number With Regrouping	

Lessons 2B-2, 2B-3 (Plan A and Plan B).....	124
The Distributive Factor Multiplying With Larger Numbers	
Lesson 2B-4: Multiplying by One-Digit Number With Regrouping.....	126
Lessons 2B-5, 2B-6.....	129
Multiplying by a Two-Digit Numer How About Multiplying Larger Numbers?	
Lessons 2B-7, 2B-8.....	134
Can You Divide? Zero in Division	
Lessons 2B-9, 2B-10.....	137
Dividing by a One-Digit Divisor Dividing into a Larger Dividend	
Lesson 2B-11: Short Division.....	139
Lesson 2B-12, 2B-13.....	139
Divisors Between 10 and 100 Dividing With a Larger Dividend	
Lesson 2B-14: Dividing by a Number Between 100 and 1,000.....	143
Lesson 2B-15: Problems Using Several Operations.....	144

NIVEL 2C: FACTORES Y MÚLTIPLOS

Overview.....	147
Behavioral Objectives (See Level 2A).....	91
Lessons 2C-1, 2C-2.....	147
Factors and Products Finding All Factors of a Number	

Lessons 2C-3, 2C-6.....	151
Even and Odd Numbers	
Divisibility	
Lessons 2C-4, 2C-5.....	153
Prime and Composite Numbers	
Finding Prime Numbers	
Lessons 2C-7, 2C-8.....	158
Exponents	
Using Exponents	
Lesson 2C-9: Prime Factorization.....	159
Lessons 2C-10, 2C-11.....	160
Common Factors	
Greatest Common Factor	
Lessons 2C-12, 2C-13.....	162
Multiples	
Least Common Multiple	
Answer Keys: Student Booklets, Patterns and Activities, Tests.....	167
Patterns and Activities.....	213
Tests.....	235
NIVEL 3: LA MEDIDA	
Overview.....	241
Behavioral Objectives.....	241
Contrastive Features.....	241
Lessons 3-1, 3-2, 3-3.....	242
Hours of the Day	
Minutes	
Shortcuts to Minutes	

Lessons 3-4, 3-5.....	244
Measurement by Pictures	
Small to Large Measurement by Pictures	
Lessons 3-6, 3-7.....	246
Changing Larger Units of Measure to Smaller	
Units of Measure	
Changing Smaller Units of Measure to Larger	
Units of Measure	
Lesson 3-8: Using Measures of Time.....	247
Lessons 3-9, 3-10.....	249
Using Dry Measure	
Using Liquid Measure	
Lesson 3-11, 3-12.....	250
Using Measures of Weight	
Using Measures of Length	
Lesson 3-13: Adding Measurements.....	252
Lesson 3-14: Subtracting Measurements.....	253
Answer Keys: Student Booklet, Tests.....	257
Patterns and Activities.....	269
Tests.....	273

FOREWORD

The first version of LAS MATEMÁTICAS: LENGUAJE UNIVERSAL was developed, pilot-tested, and edited by the Bilingual Materials Development Center in Fort Worth, Texas. The final copy editing and book design was done by the editorial and graphic-arts staff and freelance consultant artists of the Dissemination and Assessment Center for Bilingual Education. The responsibility of DACBE is to provide publication facilities to all the various bilingual development projects of the National Network for Bilingual Education, and other bilingual programs in the U.S. The distribution of this math program is part of the effort to give greater exposure to the materials produced by the bilingual projects in the United States and to make these materials available to all in the United States and to make these materials available to all interested parties, thus also increasing the communication among groups engaged or interested in bilingual bicultural education.

LAS MATEMÁTICAS: LENGUAJE UNIVERSAL is a sequential course of study encompassing a balance of modern and traditional concepts and skills. It integrates culturally relevant situations and illustrations with mathematics to reinforce the student's self-concept and encourage cultural pride. This bilingual, highly versatile program may be used as a self-contained continuum, as a supplement to another course of study, for individualized instruction, or in the large group of the traditional classroom. These materials are written in English and Spanish for grades 6-8, but may be used for other grade levels and the items contained are:

Teacher's Guide I -- Levels 1-3
5 Student Booklets -- Levels 1-3
Teacher's Guide II -- Levels 4-6
6 Student Booklets -- Levels 4-6

We would like to acknowledge all the individuals who made valuable contributions to this program. The cover illustration was done by Amado Maurilio Peña, the cover layout design by Kathy McElroy-Simmons, graphic arts for the Teacher's Guide by Steve Chambers, and the typing of the manuscript by Brenda Garrett. Without their assistance, the publication of this program would have been impossible.

Your comments and suggestions regarding this product will be appreciated.

Carlos E. Pérez, Director
Dissemination and Assessment
Center for Bilingual Education

ACKNOWLEDGEMENTS

This publication, *LAS MATEMATICAS: LENGUAJE UNIVERSAL*, was developed by the Bilingual Materials Development Center under a Title VII grant awarded to the Fort Worth Independent School District by the United States Office of Education. A comprehensive product evaluation design was utilized in developing the text which is a part of the *Águila Volante* Series.

In the formative stages the materials were subjected to internal quality checks intended to evaluate validity of content, simplicity of design, correlation of objectives and tests, and relevancy and appropriateness of activities for the intended audience.

A committee of teachers under the direction of Crawford Johnson, Program Director, Secondary Mathematics, for the Fort Worth Independent School District submitted ideas for classroom procedures which were later incorporated into the teacher material. The materials were also submitted to teachers for a design test to ensure their accuracy and relevancy in the classroom. Bill Martínez, BMDC evaluator, conducted the testing. Those participating in the design test were Sam Castillo and Raul Manríquez.

A pilot test version was completed and testing was conducted during the 1976-1977 school year in coordination with other centers in the National Network of Centers for Bilingual Education. Selected classrooms in New Mexico, Texas, and Colorado were utilized in evaluating these materials. The data produced by the pilot test was reviewed, and necessary revisions were incorporated into this version.

The authors of this publication, Fay Osborn and Verónica Alvarez, spent many hours researching, writing, and checking the applicability of these materials. The revision team included Roberta Holiday and Luis C. Díaz, Editors; Evelyn Villa O'Dell, Writer; and Laurette P. Thompson, Consultant.

Other Bilingual Materials Development Center personnel involved in the development of this publication included Carlos E. Pérez, Project Director, Jean Thompson and José A. López, Assistant Project Directors; Arturo Peña, Editor; Whitney Graves, David Chapa, and Paulette Shook, Artists; and Luis J. Meza, Media Specialist. Numerous typists were also contributors to the production of this publication.

We express our sincere appreciation to each individual who has contributed to the development of this publication.

INTRODUCTION

THE AGUILA VOLANTE SERIES

The AGUILA VOLANTE mathematics continuum can serve as a basic course of study for students and their teachers in grades 6-8 or can be used to complement other texts. The program provides a balance between modern and traditional mathematics, presenting the structure of a mathematical system, while also emphasizing basic computational skills.

Although the program was designed to fill a void which exists in instructional materials for the monolingual Spanish speaker, it may also be used with native English speakers and with bilingual students.

This bilingual mathematics continuum presents a series of six welldefined levels through which the student advances.

LEVEL 1	Numbers and Numeration
LEVEL 2	
Booklet A	Addition and subtraction of Whole Numbers
Booklet B	Multiplication and Division of Whole Numbers
Booklet C	Factors and Multiples
LEVEL 3	Measurement
LEVEL 4	
Booklet A	Multiplication of Fractions
Booklet B	Division of Fractions
LEVEL 5	
Booklet A	Geometry: Sets of Points
Booklet B	Linear Measure, Perimeter and Area
LEVEL 6	
Booklet A	Addition of Fractions
Booklet B	Subtraction of Fractions

APPROACHES TO THE MATERIAL

The booklets lend themselves readily to individualized and small group instruction; however, at the same time they can be utilized for total classroom instruction. If the teacher finds it necessary to have the class as a whole progress through the mathematics program at the same rate, he will find that these booklets facilitate presentation to such a group. However, it is recommended that the instructional program be based on continuous progress, allowing for differences in students' learning processes and in

rates of learning. The flexibility necessary to establish continuous progress can best be assured by the use of team teaching. Team teaching utilizes each teacher's abilities to the highest degree while providing a setting which gives the student opportunities for learning at his highest potential.

STUDENT PLACEMENT WITHIN LEVELS

It is recommended that sixth grade students complete at least Levels 1 - 6 of the continuum. Students of other intermediate grades, depending on their background and needs, may also use the booklets on these levels.

TIME LINE GUIDES

The suggested amount of time needed to complete each booklet is two weeks; however, Booklets 2A, 2B, and 4A are likely to require approximately one additional week.

MANAGEMENT SYSTEMS

Every continuous progress program should include (a) a method for grouping students, (2) frequent sequential presentations, (3) a plan for goal setting for each student, (4) a testing center or area (if staffing permits), and (5) laboratory experiences. The following suggestion may be helpful.

Grouping

ALTERNATIVE 1

At the beginning of the grading period, students have been assigned through office personnel into classes. These classes could remain as advisory classes. As a result, there will be a wide range of levels in the advisory classes. These students need to be regrouped according to levels and scheduled for presentations at least twice a week. Each presentation group should include as few levels as possible. Thus, students will meet with their advisory group three days a week for individual assistance and goal setting, and two days a week will be spent in presentations. This alternative lends itself to Model 1.

ALTERNATIVE 2

Students may be grouped according to levels and assigned to a given teacher for a specific period of time. If this alternative is followed, the teacher is responsible for seeing that each level assigned receives at least two planned sequential presentations per week. This alternative lends itself to Models 2, 3, 4, and 5.

ALTERNATIVE 3

In open space, a presentation schedule should be prepared and each teacher assigned lecture topics. Students may be seated according to levels in open space or they may be seated in advisory groups and scheduled into lectures. This alternative lends itself to Model 4.

Presentations

Since presentations are an essential part of all management models, the mathematics department in each school should develop a presentation schedule, based on the model that has been selected. A time schedule for covering each level should also be included. Teacher assignments for presentations should be made in advance to assure that the teacher has adequate preparation time. Presentations are not necessarily formal lectures. The teacher should present a maximum amount of information in a minimum amount of time and should encourage student participation. A teacher may desire to use filmstrips, slides, tapes, prepared transparencies, films or any other audio-visual equipment to aid the student in acquiring information. Small group discussions, large group discussions, question/answer periods, and laboratory experiences are good ways of teaching concepts to the students.

Many times the level of the students' comprehension of a concept can be enhanced by watching students work problems at the chalkboard. Students are aided by getting involved physically with such materials as meter sticks, compasses, rulers, and protractors. This gets the students involved in the presentation.

Goal Setting

Since goals are based on the student's ability, each mathematics department should develop a schedule for assignments, based on the ability of the students and adapted to the management model which has been selected. A student's goals may be assigned to him as an individual or as part of a group; they may be given orally or in writing. The teacher should record the student's goal each time goals are set. These records are helpful in assigning future goals and grades. Any combination of the following methods of goal setting may be used.

ALTERNATIVE 1

A student may be assigned to an advisory teacher for the six weeks, the quarter, or the year. The student meets with the teacher one day per week for this purpose. On this day, the teacher reviews the previous week's work and sets goals for the coming week.

ALTERNATIVE 2

At times it may be necessary to set daily goals for students who are not progressing. These students may be given a daily assignment which is turned in or checked for completeness at the end of the period or at regular intervals.

ALTERNATIVE 3

Students may be advised by the classroom teacher if the students are grouped by levels. This means the goal setting would be done by several teachers throughout the year. Each teacher advises the students in the levels assigned to him.

Scheduling

The following suggested models provide some possible ways of utilizing the class time; they can be modified by your staff so that they fit your situation.

MODEL 1

One day of the week, for example, Monday, should be set aside for goal setting, allowing approximately two minutes per student. This leaves Wednesday and Friday free for answering individual questions. Ten to twenty minutes is allowed for each level presentation on Tuesday and Thursday. Time allotments and the number of presentations may vary according to the material being taught. Total team cooperation on the part of teachers is required, since the students of an advisory class are assigned to several teachers and move to different rooms for the presentations.

MODEL 2

One day of the week, for example, Monday, should be set aside for goal setting, allowing approximately two minutes per student. Tuesday through Friday is spent giving both individual help and presentations. Approximately half of the levels should be given presentations on Tuesday and Thursday and the other half on Wednesday and Friday. This would give the teacher approximately half of the class time on these days for individual assistance. The advisory class and the presentation group may be the same or they may be different.

MODEL 3

The teacher is responsible for advising and for making presentations to the same students all week. The teacher could spend twenty minutes of each day answering individual questions. Fifteen minutes could be used for advising. The teacher could divide each class into fifths. One fifth of the students could be advised each day. Advisory class is organized

on the basis of levels and advisory day is the same day each week for the student. Twenty-five minutes is reserved for class presentations. In order to keep to a minimum the number of levels assigned to any teacher, it is helpful to reassign advisory groups periodically.

MODEL 4

All goal setting for the week is done on Mondays, with approximately two minutes per pupil allowed. Tuesday through Friday is for individual help and presentations. The student leaves the individual help area and goes to a presentation of ten to fifteen minutes on his level two times a week. In an open space area, one teacher can make four to five presentations per class period and, in an individual classroom, two or three presentations. This model can be utilized best in an open space area which is shared by two or more teachers. In order to keep to a minimum the number of levels assigned to any teacher, it is helpful to reassign advisory groups periodically.

MODEL 5

On the basis of levels, a group of students is assigned to a teacher. The teacher makes presentations to approximately half of the levels on Monday and Wednesday, and the other half on Tuesday and Thursday, giving an assignment at the end of each presentation. Thirty minutes is allowed each day for individual help and for giving assignments to the groups that do not receive a presentation. Some students may work at a faster pace than the one set by the teacher and may test earlier than other students in the group. Friday can be utilized for individual assistance, presentations, tests, or miscellaneous activities. There is no designated advisory day; some students are advised each day.

Testing Center

Any of the following alternatives may be selected for use with any of the five management models.

ALTERNATIVE 1

A testing center may be set up in a separate room, a corner of an open area, a hallway, or wherever space is available. When a teacher is available to staff the center, the teacher may grade, record, and issue new or recycled materials in the center. If the teachers prefer, the tests may be graded and returned to the classroom teacher for recording and issuing of appropriate materials. In order to have a teacher available in the testing center, the students assigned to this teacher must be distributed among the remaining teachers.

ALTERNATIVE 2

A testing center may be set up and staffed with an aide. An aide may grade and record the tests, but a teacher must determine whether the student is ready to move to the next level. The teacher must decide what new material the student should receive.

ALTERNATIVE 3

If it is impossible to have a testing center, students may be tested by the teacher to whom they are assigned. If this is done, it is suggested that a small area of the room be designated as the testing area, in order to make test supervision easier. If testing is done in individual rooms, the teacher is responsible for the grading, recording, and issuing of new materials.

ALTERNATIVE 4

Two departments within a school could share the same testing center. In this case the room being used as a testing center may be used by the mathematics department only certain days per week or the two may share it jointly.

Mathematics Laboratory

A mathematics laboratory can be set up with materials available in the school. These materials could include calculators, computer terminals (if available), filmstrip viewers, tape recorders and/or players, and headsets. Other media available are filmstrips, cassette tapes, filmstrips with cassettes, puzzles, games, and drill and practice sheets. Teachers may supplement these materials with teacher or student-made slides, games, or tapes.

It is an advantage to both teachers and students to have all materials catalogued according to level. Each mathematics department should devise a plan for assigning students to the laboratory.

ALTERNATIVE 1

If space is limited, a testing center and laboratory may be combined. One area should be set up with tables and equipment for the laboratory, and another area should have desks for testing. A teacher or an aide may supervise both areas. Student assistants, if available, may be used in the laboratory area. They may pass out materials, help students get started on machines, teach students how to use calculators, put up materials, and other related jobs.

ALTEPNATIVE 2

A laboratory may be set up without a testing center. The above procedure should be followed.

ALTERNATIVE 3

If staffing and space are problems, one room can serve as both a testing center some days and a laboratory on other days. On the testing center days, all equipment should be stored. On laboratory days, the equipment should be placed around the room on tables or desks.

ALTERNATIVE 4

In schools where a separate room is not available for a laboratory, the equipment may be set up in a classroom or distributed among the various classrooms. Plans need to be made far enough in advance so that teachers will have the proper materials and equipment in their rooms set up and ready for use.

ASSIGNMENT OF MATERIALS

Every student should have the option of pretesting on each level. Pretesting determines whether the student progresses to the next level without doing the set of required materials for that given level. It may also help the student see a need for studying this material. Ninety percent (90%) achievement or better should be required in order to progress to the next level. A pupil may be allowed to work on certain concepts within a level instead of doing the entire level if a pretest indicates that this is feasible.

At the beginning of each level that a pupil is to study, he should be issued a booklet. To help him progress through the level, the teacher, at his own discretion, should make assignments based on the pupil's need. It is not necessary to assign every problem in every exercise. After the student has completed the prescribed learning activities, he is given a posttest. If he does not make a satisfactory grade on the posttest, the teacher should provide him with review materials that will help him learn the concepts he has not understood. These review materials might include the textbooks named on the reference chart, other textbooks, or teacher-made materials. When a student completes the review material, he will be given a second posttest.

GRADING

A record of each student's grades should be kept on a grade card. The mathematics department should develop a consistent method of assigning grades. It is suggested that at least two daily grades should be given each week. One of these grades may be an advisory grade, based on the

work the student has completed compared to his goal. The other grade booklet. Daily tests, review, daily exercises, completing of assigned work, and class participation could also serve as a basis for grades. Test grades should be recorded on the grade card. If a student is progressing through a level for the second time, making use of the review materials, this information should be indicated on the grade card. The teacher should make sure that enough grades are on the grade card to justify the grade for the reporting period.

FORMAT OF TEACHER'S EDITION

This book for the teacher is designed to accompany the Levels 1-3 student booklets and to provide the necessary instructions for using it effectively. The teacher should become familiar with the sequence and purpose of each section of this book so that ne/she can efficiently locate materials as needed. Sections are as follows:

Overview

The overview to each level gives a general orientation to the scope and purposes of the content covered.

Behavioral Objectives

All the behavioral objectives for the level are listed.

Contrastive Features

This section explains important contrastive features of the mathematics processes taught at the level. In some Hispanic countries (Latin American countries and Spain), a different procedure is followed in some mathematics processes than that usually taught in the United States. These procedures are explained in this section for each level.

The directions given in the exercises of the booklets ask that the students show all his work. This helps the teacher to see whether or not the student really understands the mathematical concepts involved. However, the student who has learned his mathematics in a Hispanic country and who is new to the United States will probably use a different method in working some problems. (The term HISPANIC STUDENT, when used in this section, is given a specialized meaning and identifies such a student.) He may have been taught to do many or all of the calculations mentally, showing little or no work. It is most important that such a student be given full credit for correct answers, even though no work is shown or he has used a different procedure to arrive at the answer. In time he will

probably learn the method taught in the classroom. Meanwhile, it is best not to slow his progress in mathematics by confusing him and trying to force him to adjust to a different procedure.

Presentation of Lessons

A recommended procedure is given for each grouping of related lessons. The presentation itself consists of the following divisions:

CONCEPTS: Major mathematical concepts included in the lessons

VOCABULARY: Important mathematical terms which the student needs to know in order to understand the lesson

RESOURCES: List of concrete objects to be used in the presentation, other audio-visual aids, patterns for transparencies, etc.

OPTIONAL RESOURCES: Tapes, filmstrips, etc., which would be useful as supplementary activities

PROCEDURE: Concise instructions to the teacher, step-by-step on how to present and explain to the students the mathematical concepts included in the lessons. Approximately 10 to 15 minutes is required for each presentation unless otherwise indicated.

Answer Keys

Answer keys are provided for the exercises of each student booklet of the level as well as for the M pages.

Patterns and Activities

This section contains patterns for the teacher's use in making either duplicating masters or transparency master. They are numbered in sequence with M meaning MODELO (master of pattern), followed by the level number, dash, and number in sequence. Thus Level 1 masters are numbered M1-1, M1-2, M1-3, etc. The M pages to use with a particular lesson are listed under "Resources" for the lesson. Also included in this section are patterns for reproduction for use in activities described in the Presentation.

Tests

Two tests for the level are included, along with answer keys. The tests may be used either as pretest or posttest, or the teacher may prefer to create tests for the level. Frequent short quizzes are recommended in order to be sure the students are mastering the content as they progress through a level.

FORMAT OF STUDENT BOOKLETS

It will also be helpful for the teacher to be familiar with the design of the student booklets. Each booklet is written in English and Spanish, with corresponding pages facing each other. Student materials are presented in the following sequence:

List of Symbols

The mathematical symbols used in the booklet are listed along with their meanings.

Table of Contents

Series of Lessons

Each lesson is followed by an exercise which provides practice work to help the student develop mathematical skills and understand the concepts taught in the lesson.

Review

Glossary

Mathematical terms are defined in English and Spanish.

Reference Chart

These charts give page numbers of explanations and problems in other textbooks covering the same material. These may be used for supplementary work. They are especially helpful in reteaching a level. A student who has completed his written assignments on a level but has not yet mastered the content can be assigned some of these additional problems. They will provide extra practice work to help him master the concepts covered at a given level.

Scheduling

Model 1

MONDAY			TUESDAY				WEDNESDAY				THURSDAY				FRIDAY				
60 min.			15	10	15	20	60 min.				15	15	15	15	60 min.				
Advisory Class with Goal Setting			P ₁	P ₂	P ₃	P ₄	Advisory Class with Individual Help				P ₁	P ₂	P ₃	P ₄	Advisory Class with Individual Help				
Lab			Testing				Testing				Testing				Testing				
60 min.			10	15	15	20	15	10	15	20	10	15	15	20	15	10	15	10	10

Model 2

Advisory Class with Goal Setting			P ₁	Ind. Help	P ₂	Ind. Help	Ind. Help	P ₃	P ₄	Ind. Help	P ₁	Ind. Help	P ₂	Ind. Help	Ind. Help	P ₃	Ind. Help	P ₄	Ind. Help
Lab			Testing/Lab				Testing/Lab				Testing/Lab				Testing/Lab				
20	25	15	25	20	15	20	25	15	20	25	15	20	25	20	15	25	20	15	25

Model 3

Ind. Help	P ₁	Adv. Group I	P ₃	Ind. Help	Adv. Group II	Ind. Group	P ₁	Adv. Group III	Adv. Group IV	P ₃	Ind. Help	Ind. Help	Adv. Group V	P
	P ₂		P ₄				P ₂			P ₄				P
Testing/Lab			Testing/Lab			Testing/Lab			Testing/Lab			Testing/Lab		

	MONDAY			TUESDAY			WEDNESDAY			THURSDAY			FRIDAY	
Model 4	60 min.			60 min.			60 min.			60 min.			60 min.	
	Advisory Class by Levels with Goal Setting			Advisory Class by Levels with Individual Help and Sequenced Presentations			Advisory Class by Levels with Individual Help and Sequenced Presentations			Advisory Class by Levels with Individual Help and Sequenced Presentations			Advisory Class by Levels with Individual Help and Sequenced Presentations	
	Testing/Lab			Testing/Lab			Testing/Lab			Testing/Lab			Testing/Lab	
	15	30	15	15	30	15	15	30	15	15	30	15	60 min.	
Model 5	P ₁ and Assign- ment	Individual help and Assignment for Group 3 & Group 4	P ₂ and Assign- ment	P ₃ and Assign- ment	Individ- ual help & Assign- ment 1 & for Group 2	P ₄ and Assign- ment	P ₁ and Assign- ment	Individ- ual help & Assign- ment for Group 3 & Group 4	P ₂ and Assign- ment	P ₃ and Assign- ment	Individ- ual help & Assign- ment for Group 1 & Group 2	P ₄ and Assign- ment	Individual Help, Presentations, Testing, Lab, or Miscellaneous Activities	
	Testing/Lab			Testing/Lab			Testing/Lab			Testing/Lab				

P₁ = Presentation for Group 1
 P₂ = Presentation for Group 2
 P₃ = Presentation for Group 3
 P₄ = Presentation for Group 4

NÚMEROS Y NUMERACIÓN

OVERVIEW OF LEVEL 1

NÚMEROS Y NUMERACIÓN

OVERVIEW OF LEVEL 1

Level 1 is appropriate to use at any grade level to introduce a class to the Mathematics Continuum, to present the concept of set and set notation, and to review place value in the whole numeral system. By means of class presentations, explain the concepts contained in the level, guiding the students through the booklet in such a way that they become familiar with the format and learn to use the booklet to recall important points of the presentation before beginning work on their assignments.

In sequencing the material, you may wish to teach Lesson 1-6: FLOW CHARTS immediately after Lesson 1-2, so that you can use the tool of flow charting in teaching the concepts of the remaining lessons.

If you have students who have a weak mathematical background or who find it difficult to learn mathematics, you may wish to omit Lesson 1-4: USING EXPONENTS, postponing it until Level 2C and teaching it in conjunction with Lesson 2C-7: EXPONENTS. If you choose to do this, have the students write numbers in expanded notation in Lesson 1-5, but without using exponents.

In Booklet 1, a careful distinction is made between the terms number and numeral, since these two concepts are being taught to the students. In later booklets of the continuum, however, number is often used in place of numeral, in accordance with common usage. Maintaining a distinction between the two terms is difficult for many students and sometimes distracts them from other concepts which are being presented.

Booklet 1 is designed to require about ten days for the average student to complete. However, this time span is meant to serve as a guideline only, in order to help you pace the students' work. Students with a strong mathematical background will be able to complete Level 1 in a shorter period of time, while others will need a longer period.

BEHAVIORAL OBJECTIVES

1. Given a whole number less than 1,000,000,000, the student will designate the place value of any of its digits with 75% accuracy.
2. Given word descriptions of two sets, one of whole numbers and one of grouped items, the student will list their elements with 50% accuracy.
3. Given three subsets of the set of whole numbers, the student will arrange the numbers in natural order and graph them on a number line with 100% accuracy.

4. Given four whole numbers less than 1,000,000,000, expressed in decimal numerals, the student will write word expressions for the numerals with 75% accuracy.
5. Given two natural numbers less than 1,000,000,000, expressed in decimal numerals, the student will write them in expanded notation with 100% accuracy.
6. Given four natural numbers less than 1,000,000,000, the student will round the numbers to the designated power of 10 with 75% accuracy.
7. Given three decimal numerals representing natural numbers less than 2,000, the student will change the decimal numerals to Roman numerals with 66% accuracy.
8. Given three Roman numerals representing natural numbers less than 2,000, the student will change the Roman numerals with 66% accuracy.

CONTRASTIVE FEATURES

THE NUMERAL 7

The student who has recently moved to the United States from a Hispanic country may be accustomed to writing the symbol "7" to express the numeral 7. Since "7" can be mistakenly read as 4, the teacher who is aware of this usage will be able to avoid making mistakes in correcting the student's written work.

THE USE OF COMMAS AND PERIODS

In this mathematics program, commas are used in large numerals to separate the digits into groups of three, since this system is used in the United States. In Hispanic countries, however, periods are used to separate the groups of numerals. The following example illustrates the difference in usage.

NUMERAL EXPRESSED IN WORDS	IN THE UNITED STATES	IN HISPANIC COUNTRIES
tres millones cuatrocientos veinte mil ochocientos cincuenta y seis		3.420.856
three million, four hundred twenty thousand, eight hundred fifty-six	3,420,356	

DEFINITION OF BILLION (BILLÓN)

In Lesson 1-3, the table giving the place value of numbers defines a billion (billón) as it is used in the United States -- that is, a thousand million (mil millones). In Hispanic countries, however, a billion (billón) means a million millions (millón de millones). The following examples illustrate the difference in usage.

NUMERAL	IN THE UNITED STATES	IN HISPANIC COUNTRIES
5,380,407,962 is read	five <u>billion</u> , three hundred <u>eighty million</u> , four hundred seven thousand, nine hundred sixty-two	five thousand-three hundred <u>eighty million</u> , four hundred seven thousand, nine hundred sixty-two
	cinco <u>billones</u> tres-cientos ochenta <u>millones</u> cuatro-cientos siete mil novecientos sesenta y dos	cinco mil trescientos ochenta <u>millones</u> cuatro-cientos siete mil novecientos sesenta y dos
6,590,700,204,854 is read	six trillion, five hundred ninety billion, seven hundred million, two hundred four thousand, eight hundred fifty-four	six billion, five hundred ninety thousand million, seven hundred million, two hundred four thousand, eight hundred fifty-four
	seis trillones quinientos noventa <u>billones</u> setecientos <u>millones</u> doscientos cuatro mil ochocientos cincuenta y cuatro	seis billones quinientos noventa <u>mil</u> seiscientos <u>millones</u> doscientos cuatro mil ochocientos cincuenta y cuatro

These booklets present the method of reading numerals which is used in the United States.

THE SET, NUMBER, AND NUMERAL

LESSON 1-1

Student Booklet p. 3

CONCEPTS

Definition of set
Number
Numeral
The set of whole numbers

VOCABULARY

conjunto
conjunto infinito
conjunto vacío
correspondencia uno a uno
elemento o miembro
equivalente
igual
numeral
número
números enteros

set
infinite set
empty set (null set)
one-to-one correspondence
element or member
equivalent
equal
numeral
number
whole numbers

RESOURCE

Transparency M1-1

PROCEDURE

Use two days for this presentation, one day for Part I and another day for Part II.

Parte I

Defina conjunto y elemento (miembro) de un conjunto.
Presente ejemplos de conjuntos cuyos miembros sean bien conocidos por los estudiantes, escribiéndolos en la pizarra y designándolos por medio de letras mayúsculas.

Part I

Define set and element (member) of a set. Give examples of sets whose members are familiar to the students, writing them on the chalkboard and naming them by capital letters.

Sugerencias:

- Conjuntos de algunos estudiantes. Por ejemplo: $A = \{\text{María, Roberta, Ana, Juan}\}$
- Conjuntos de algunos de los animales domésticos preferidos de los estudiantes. Por ejemplo: $B = \{\text{Chiquita, Imán}\}$
- Conjuntos de figuras geométricas.
Por ejemplo:
 $C = \{\diamond, \circ, \triangleright, \square\}$
- Conjuntos de números enteros.
Por ejemplo:
 $D = \{3, 6, 7, 8, 9\}$

Pida a los estudiantes que escriban en la pizarra otros ejemplos de conjuntos.

Explíqueles el significado de los símbolos $\in$ y $\notin$. Después borre las letras mayúsculas y los signos de igualdad que preceden a los conjuntos escritos en la pizarra. Delante de cada conjunto escriba un ejemplo del objeto, contenido o no en el conjunto. Después haga que un estudiante escriba el símbolo apropiado $\in$ o $\notin$ entre el nombre del objeto y el conjunto. Por ejemplo: Jaime $\in$ {María, Roberto, Ana, Juan}

$\diamond \in \{\diamond, \circ, \triangleright, \square\}$

Para presentar el concepto de conjunto vacío pida a un estudiante que escriba en la pizarra el conjunto de todos los estudiantes que tengan dos metros y medio (siete pies) de altura. Explíqueles que el conjunto vacío se representa por medio de uno de estos símbolos: $\{ \}$ o $\emptyset$.

Some suggestions are:

- Sets of some of the students of the class. For example: $A = \{\text{Mary, Bob, Ann, John}\}$
- Sets of some of the pets of the students. For example: $B = \{\text{Chiquita, Imán}\}$
- Sets of geometric figures. For example:
 $C = \{\diamond, \circ, \triangleright, \square\}$
- Sets of whole numbers. For example:
 $D = \{3, 6, 7, 8, 9\}$

Have the students write other examples of sets on the board.

Explain the meaning of the symbols $\in$ and $\notin$. Then erase the capital letter and the equal signs which precede the sets written on the chalkboard. In front of each set, write an example of an object which may $\in$ or $\notin$ may not be a member. Then have a student write the correct symbol, or $\in$ or $\notin$, after the name of the object.

For example:

Jim $\in$ {Mary, Bob, Ann, John}

$\diamond \in \{\diamond, \circ, \triangleright, \square\}$

Present the concept of empty set by asking a student to name in writing the set of all students in the class who are seven feet tall. Explain that $\{ \}$ and $\emptyset$ are both symbols for the empty set.

Explíqueles los conceptos de correspondencia uno a uno, conjuntos equivalentes y conjuntos iguales. Use ejemplos para hacer los conceptos más claros. Siempre que sea posible use como ejemplos los conjuntos que ya tiene escritos en la pizarra.

Parte II

Explíqueles que el sistema de numeración que usamos hoy día se formó y desarrolló a través de los siglos a partir del hombre de las cavernas. Hágales ver cómo el hombre se vió forzado por la necesidad de inventar símbolos para representar los números.

Mediante esos símbolos se hizo posible no sólo hacer cálculos por escrito sino también registrar y mantener cuentas de las transacciones de cambio y de compraventa una vez que se introdujo el dinero en su forma más primitiva

Explíqueles que número es la cantidad, mientras que numeral es el símbolo por el cual se representa la cantidad.

Todos los numerales siguientes representan el número cinco.

Hombre primitivo	ooooo
Hombre primitivo	≡
Egipcio antiguo	
Maya	—
Romano	V
Indo-arábico	5

Explain the concept of one-to-one correspondence, equivalent sets, and equal sets. Illustrate them by giving example, using, whenever possible, the sets which are already written on the board.

Part II

Discuss how our number system evolved through the years, beginning with the most primitive cave-men. Explain how man, through necessity, invented symbols for numbers in order to keep a record of counting and of other simple calculations, such as bartering and payment.

Use of symbols became a necessity once money was introduced in its most primitive form.

Explain that number is the quantity, while numeral is the symbol used to represent the quantity.

The following numerals all represent the number five.

Caveman	o o o o o
Caveman	≡
Ancient Egyptian	
Mayan	—
Roman	V
Hindu-arabic	5

Palabra inglesa five

English word five

Palabra española cinco

Spanish word cinco

Haga una transparencia del Modelo M1-1. Haga las preguntas a los estudiantes y pídale que distingan oralmente entre números y numerales.

Make a transparency from Pattern M1-1. Ask the students the questions and have them answer orally, distinguishing between numbers and numerals.

Dé varios ejemplos de diversos símbolos (numerales) por los que se representa la idea abstracta de números.

Give several examples of various symbols (numerals) that represent the abstract idea of a number.

Por ejemplo, todos los numerales o símbolos siguientes representan el número diez.

For example, the following numerals or symbols all represent the number 10.

Hombre primitivo ○○○○○○○○○○

Caveman ○○○○○○○○○○

Hombre primitivo 

Caveman 

Egipcio antiguo ∩

Ancient Egyptian ∩

Maya =

Mayan =

Romano X

Roman X

Indo-arábico 10

Hindu-arabic 10

Palabra inglesa ten

English word ten

Palabra española diez

Spanish word diez

GRAPHING ON A NUMBER LINE

LESSON 1-2

Student Booklet p. 15

CONCEPTS

Set of whole numbers

Definition of subset

Arrangement of a set of numbers in natural order

Graph of a set of numbers on the number line

VOCABULARY

gráfica
números enteros
orden natural
recta numérica
subconjunto

graph
whole numbers
natural order
number line
subset

RESOURCES

Transparencies M1-2 and M1-3

PROCEDURE

Repase la idea del conjunto de los números enteros: 0,1,2,3,4... Para enseñar a los estudiantes a trazar una recta numérica, trace una en la pizarra. Destaque que los números deberán colocarse a distancias iguales a lo largo de la recta.

Diga un número, 4 por ejemplo, y pida a un estudiante que comience a contar a partir de ese número. Haga notar lo inconveniente y hasta lo ridículo que sería contar del 1 al 10 en la forma siguiente:

"10, 4, 3, 1, 2, 5, 7, 6, 8, 9"

Explíqueles que disponer los números en orden natural quiere decir ponerlos en el orden en que se cuenta, del más pequeño al más grande.

Enseñe a los estudiantes a representar conjuntos de números en una recta numérica, dándoles para ello bastantes ejemplos. Dé la definición de subconjunto, y

Review the fact that the set of whole numbers of 0,1,2,3,4... To show the students how to make a number line, draw one on the chalkboard. Emphasize that the numbers must be equal distances apart.

Name a particular number, for example 4, and have a student start counting from that number. Point out how inconvenient and ridiculous it would be if we tried to count from 1 to 10 in the following manner:

"10, 4, 3, 1, 2, 5, 7, 6, 8, 9"

Explain that when you arrange a group of numbers in natural order, you are putting them in counting order, arranging them from smallest to largest.

Show the students how to graph sets of number line, giving several examples. Define subset and explain that in this lesson we are

explíqueles que en esta lección se representan gráficamente diversos subconjuntos del conjunto de los números enteros.

Haga una transparencia de los modelos M1-2 y M1-3 y pida que varios estudiantes resuelvan los ejemplos.

graphing different subsets of the set of whole numbers.

Make transparencies from Patterns M1-2 and M1-3 and have several students demonstrate how to work the examples.

PLACE VALUE

LESSON 1-3

Student Booklet p. 21

CONCEPTS

Place value in whole numbers
Reading and writing large numerals

VOCABULARY

cifra (dígito)
sistema decimal
valor de lugar (posición):
 unidad simple
 decenas
 centenas
 unidad de miles
 decenas de miles
 centenas de miles
 unidades de millón
 decenas de millón
 centenas de millón
 unidades de billón
 decenas de billón
 centenas de billón

digit
decimal system
place value:
 one
 tens
 hundreds
 one thousands
 ten thousands
 hundred thousands
 one millions
 ten millions
 hundred millions
 one billions
 ten billions
 hundred billions

RESOURCES

1. Transparency M1-4
2. Worksheets M1-5 and M1-6

PROCEDURE

Explíqueles que nuestro sistema numérico se llama sistema decimal

Explain that our number system is called the decimal system because it

porque se basa en el diez (La palabra latina "decem" significa diez.)

Use la transparencia M1-4 para repasar el valor de posición de cada una de las cifras del numeral 897,215,346:

6 está en la posición de las unidades.

4 está en la posición de las decenas.

3 está en la posición de las centenas.

Continúe en esta forma hasta que haya dado el valor de posición de la última cifra, el 8. Después haga que los estudiantes lean correctamente el numeral.

Asegúrese de que los estudiantes comprenden que la nomenclatura aquí usada es una traducción directa del método que se usa en los Estados Unidos.

Escriba otros numerales en la transparencia. Haga que los estudiantes digan el valor de posición de cada una de las cifras en los numerales, y después pídale que lean correctamente esos numerales.

Escriba 6 cifras en una tira larga de papel. Doble la tira de papel en forma de abanico como se muestra en la ilustración, haciendo que los dobleces queden entre las cifras.

1	2	3	4	5	6
---	---	---	---	---	---

Después doble la tira de papel en diferentes longitudes formando distintos numerales para que los lean o escriban los estudiantes. Por ejemplo: 1,234; 23,456; etc.

is based on ten. (The Latin word "decem" means ten.)

Use Transparency M1-4 to review place value. Give the place value of each of the digits of the numeral 897,215,346:

6 is in the ones place.

4 is in the tens place.

3 is in the hundreds place.

Continue in this manner until you have given the place value of the last digit, that is, 8. then have the students read the numeral correctly.

Be sure the students understand that the version in Spanish is a translation of the method used in the United States.

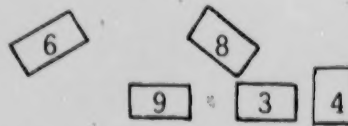
Write other numerales on the transparency. Have the students give the place value of each digit of the numerales, and then have them read the numerales correctly.

Write six digits on a long piece of paper. Fold it, like a fan, between each digit.

Then fold the paper in different places, forming different numerales for the students to read or write. For example: 1,234; 23,456; etc.

Escriba 5 cifras diferentes, cada una en un trozo distinto de papel. Coloque los trozos de papel de modo que formen un numeral de 5 cifras. Haga que los estudiantes lo lean. Luego coloque los papeles en otra forma de modo que formen otro numeral haga que los estudiantes lo lean. Repita esta actividad varias veces.

Write five different digits, each one on a separate piece of paper. Place the pieces of paper so that a five-digit numeral is formed. Have the students give the name of this numeral. Then arrange the pieces differently so that a different numeral is formed and have the students name this numeral. Repeat this activity several times.



Utilice el numeral 564,327,189 para hacer que los estudiantes practiquen el análisis del valor de posición. Pídeles que hagan ejercicios tales como los siguientes:

Use the numeral 564,327,189 to give the students practice in designating the place value of digits. Ask questions such as these:

1. Colocar las cifras de modo que formen el mayor número posible.
2. Poner los papeles de modo que las cifras formen el menor número posible.
3. Decir el número que sea 5 millones más grande que el formado.
4. Decir el número que sea 43 millones más pequeño que el formado.
5. Calcular cuánto habrá que añadir al número formado para que resulte 565,000,000.

1. Rearrange the digits to name the largest numeral possible.
2. Rearrange the digits to name the smallest numeral possible.
3. Name the number which is 5 million greater than this number.
4. Name the number which is 43 million less than this number.
5. What must be added to this number to give 565,000,000?

Haga que los estudiantes llenen los espacios en blanco en las Hojas de trabajo M1-5 y M1-6, escribiendo las palabras o los numerales que hagan las frases verídicas.

Have the students fill in the blanks on Worksheets M1-5 and M1-6, writing the words or numerals that make the statements true.

USING EXPONENTS

LESSON 1-4

Student Booklet p. 33

CONCEPT

Exponents which name powers of ten

VOCABULARY

base
exponente
potencia

base
exponent
power

RESOURCES

1. Transparency M1-7
2. Worksheet M1-8

PROCEDURE

Explique a los estudiantes que el exponente indica el número de veces que la base se usa como factor. Por ejemplo:

10^4 quiere decir:
 $10 \times 10 \times 10 \times 10 = 10,000$

Dígales que 10^4 se lee: "diez elevado a la cuarta potencia" o simplemente "diez a la cuarta potencia."

Use la transparencia M1-7 para mostrarles a los estudiantes que el valor de posición se puede expresar en potencias de diez. Dé el valor de posición de cada una de las cifras del numeral 681,345,257, expresando esos valores en potencias de diez. Por ejemplo:

Explain that the exponent shows the number of times the base is used as a factor. For example:

10^4 means: $10 \times 10 \times 10 \times 10 = 10,000$

Explain that 10^4 is read "ten to the fourth power."

Use Transparency M1-7 to show the students that each place value can be expressed as a power of ten. Give the place value of each digit of the numeral 681,345,256, expressing these values as powers of ten. For example:

7 está en la posición de las unidades, o en la posición de 10^0 .

5 está en la posición de las decenas, o en la posición de 10^1 .

2 está en la posición de las centenas o en la posición de 10^2 .

Continúe expresando en esta forma todas las cifras del número.

Escriba varios numerales en la transparencia y haga que los estudiantes den el valor de posición de cada cifra usando exponentes.

Pida a los estudiantes que completen la Hoja de trabajo M1-8.

7 is in the ones or 10^0 place

5 is in the tens or 10^1 place

2 is in the hundreds or 10^2 place

Continue in this manner until you have given the place value of all digits of the numeral.

Write several different numerals on the transparency and have the students give the place value of each digit of these numerals, using exponents.

Have the students complete Worksheet M1-8.

EXPANDED NOTATION

LESSON 1-5

Student Booklet p. 39

CONCEPT

Writing natural numbers in expanded notation

VOCABULARY

notación desarrollada

RESOURCES

Worksheets M1-9 and M1-10

PROCEDURE

Note: If you choose to delay the teaching of Lesson 1-4: EXPONENTS until Level 2C, omit the sections of this presentation which require the use of exponents.

Escriba en la pizarra el numeral 4,752 y repase como escribirlo en notación desarrollada.

Write the numeral 4,752 on the chalkboard and review how to write it in expanded notation.

$$4,752 = (4 \times 1,000) + (7 \times 100) = (5 \times 10) = (2 \times 1)$$

Después enséñeles cómo escribirlo en notación desarrollada con exponentes.

Then show how to write it in expanded notation with exponents.

$$4,752 = (4 \times 10^3) = (7 \times 10^2) = (5 \times 10^1) = (2 \times 10^0)$$

Escriba varios numerales en la pizarra y haga que los estudiantes los escriban en notación desarrollada con exponentes.

Write several different examples of numerals on the chalkboard and have the students write them in expanded notation with exponents.

Haga que los estudiantes completen las Hojas de trabajo M1-9 y M1-10.

Have the students complete Worksheets M1-9 and M1-10.

FLOW CHARTS

LESSON 1-6

Student Booklet p. 43

CONCEPT

Reading and writing flow charts

VOCABULARY

tabla de flujo

flow chart

RESOURCES

None

PROCEDURE

Explíqueles lo qué es una tabla de flujo: Un diagrama que da instrucciones para el desarrollo paso por paso de una actividad o un proceso. Aclare el concepto usando como ejemplo la tabla de

Explain that a flow chart is a diagram which gives step-by-step instructions for any process or activity. Illustrate this by using the flow charts given in Lesson 1-6 of the student's booklet. Explain the

flujo que se da en la Lección 1-6 del folleto del estudiante. Explíqueles el significado de las diversas formas que se usan para los cuadros en una tabla de flujo.

meaning of the different shapes that are used for boxes in a flow chart. (These are given in Lesson 1-6.)

Haga que los estudiantes construyan tablas de flujo para las actividades siguientes:

Have the students make flow charts for the following activities:

- a. Apearce (bajarse) de un coche
- b. Beber una soda
- c. Atar los cordones de los zapatos
- d. Participar en una carrera
- e. Cruzar la calle

- a. Getting out of a car
- b. Drinking a soda
- c. Tying shoes
- d. Running a race
- e. Walking across the street

ROUNDING NUMERALS

LESSON 1-7

Student Booklet p. 59

CONCEPT

Rounding numerals to the place indicated

VOCABULARY

redondear
posición
próximo

to round
place
nearest

RESOURCES

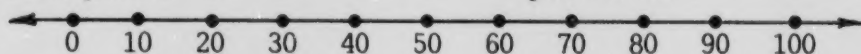
None

PROCEDURE

Mediante la siguiente actividad, trate de que los estudiantes comprendan mejor el concepto de orden en el conjunto de los números enteros.

By means of the following activity, try to strengthen the students' understanding of the concept of order in the set of whole numbers.

Trace una recta numérica en la pizarra y sobre ella represente los múltiplos de 10.



Introduzca el símbolo que significa "es menor que." Pida a los estudiantes que comparen los números 60 y 70, diciendo cuál es menor.

Respuesta: $60 < 70$

Déles varios ejemplos de pares de números que sean múltiplos de 10, y pídales que los comparen diciendo cuál es menor en cada caso. después llévelos a comparar tres múltiplos de 10. Por ejemplo, hágaes ver que $60 < 70$ y que $70 < 80$, y explíqueles que puesto que 60 es menor que 70 y 70 es menor que 80, se puede decir que 70 está entre 60 y 80. Con símbolos se puede escribir: " $60 < 70 < 80$." Déles varios ejemplos que requieran la comparación de tres múltiplos de 10.

A continuación presente ejemplos de grupos de tres números, ó 30, y 25, de los cuales el menor y el mayor sean múltiplos de 10, mientras que otro número es múltiple de 5 y no de 10. Haga que los estudiantes comparen los números, estableciendo que $20 < 25 < 30$. Podrán entonces concluir que 25 está entre 20 y 30, es decir: $20 < 25 < 30$.

Introduzca entonces el concepto de redondeo de números, usando como ejemplo el número 63. Explíqueles que para redondear 63 a la decena más próxima, nece-

Draw a number line on the chalkboard, and on it graph the multiples of 10.

Introduce the symbol which means "is less than." Ask the students to compare the numbers 60 and 70 by stating which is the smallest number.

Answer: $60 < 70$

Give the students several examples of pairs of numbers which are multiples of 10, asking them in each case to compare the numbers by telling which number is less than the other. Then guide the students in such a way that they learn to compare three numbers which are multiples of 10. For example, have them determine that $60 < 70$ and $70 < 80$. Then explain that since 60 is less than 70 and 70 is less than 80, we can say that 70 is between 60 and 80. Using symbols, we write " $60 < 70 < 80$." Give several examples which require the comparison of three numbers which are multiples of 10.

Next, give examples of number triplets such as 0, 30, and 25, in which the smallest and largest numbers are multiples of 10, while the other number is a multiple of 5 and not of 10. Have the students compare the numbers, determining that $20 < 25$ and $25 < 30$. They can then conclude that 25 is between 20 and 30: that is, $20 < 25 < 30$.

Next introduce the concept of rounding numbers by using the number 63 as an example. Explain that, in order to round 63 to the nearest ten, we must know if it is

sitamos primero determinar si 63 está más cerca de 60 ó de 70. Muchos estudiantes se darán cuenta fácilmente de que 63 está más cerca de 60. Sin embargo, si tuvieran dificultad en determinarlo, el siguiente método les ayudará. Recuérdeles que 65 está exactamente a la mitad entre 60 y 70. Puesto que $63 < 65$, 63 estará más cerca de 60. Por lo tanto 63 (redondeado a la decena más próxima) $\doteq 60$.

A continuación use la transparencia M1-11 para presentar la regla para redondear números y para hacer que los estudiantes practiquen el uso de la regla.

Note que en esta transparencia M1-11:

1. El signo de intercalación señala la posición a que se quiere redondear.
2. La cifra subrayada es la cifra de prueba. (La cifra de prueba es la cifra que está a la derecha de la posición de la que se va a redondear.)

Haga que los estudiantes practiquen el redondeo de números, completando la Hoja de trabajo M1-12.

closer to 60 or to 70. Many students will easily see that 63 is closer to 60. However, if they have difficulty in determining this, use the following method to help them. Remind them that 65 is halfway between 60 and 70. Since $63 < 65$, then 63 must be closer to 60. Therefore, 63 (rounded to the nearest ten) $\doteq 60$.

Next, use Transparency M1-11 to present the rule for rounding numbers and to have the students practice using this rule.

Note that on this transparency M1-11:

1. The caret points to the place to which the number is to be rounded.
2. The underlined digit is the test digit. (The test digit is the digit that is on the right of the place to which the number is to be rounded.)

Have the students practice rounding numbers by completing Worksheet M1-12.

ROMAN NUMERALS

LESSON 1-8

Student Booklet p. 71

CONCEPT

Reading and writing Roman numerals

VOCABULARY

numeral decimal
numeral entero
numeral romano

decimal numeral
whole numeral
roman numeral

RESOURCES

Transparencies M1-13 and M1-14

PROCEDURE

Enseñe a los estudiantes que los números representan cada uno de los siete numerales romanos básicos:

I, V, X, L, C, D y m

Utilizando la Lección 1-8 del folleto del estudiante y las transparencias M1-13 y M1-14 explíqueles las reglas para el uso de los numerales romanos; haga que practiquen la lectura y escritura de esos numerales.

Show the students the numbers which are represented by each of the seven basic Roman numerals:

I, V, X, L, C, D and M.

By making use of Lesson 1-8 in the student;s booklet and Transparencies M1-13 and M1-14, explain the rules governing the use of Roman numerals and have the students practice reading and writing them.

CLAVE/ANSWER KEY

**MANUAL DEL ESTUDIANTE
STUDENT BOOKLET**

NIVEL 1/LEVEL 1

CLAVE/ANSWER KEY

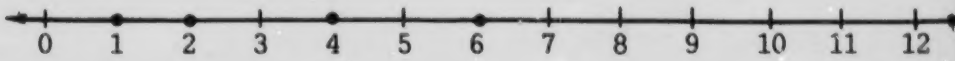
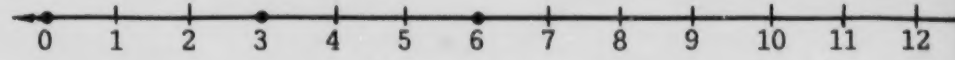
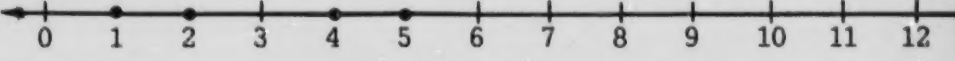
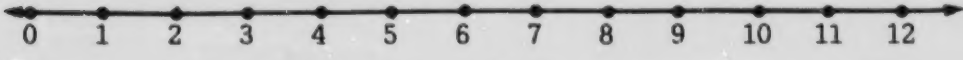
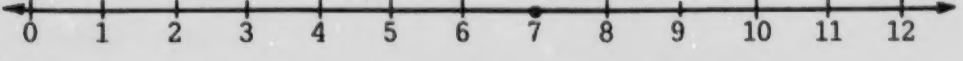
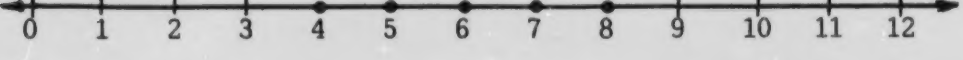
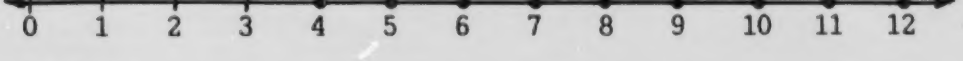
MANUAL DEL ESTUDIANTE/STUDENT BOOKLET

NIVEL 1/LEVEL 1.

EJERCICIO 1-1/EXERCISE 1-1, pages 12-13

- | | |
|--|---|
| 1. número - number | 9. {7,8} |
| 2. numeral - numeral | 10. $\emptyset$ |
| 3. numeral - numeral | 11. {X, *, \$, #, &} |
| 4. número - number | ↓ ↓ ↓ ↓ ↓ |
| 5. {x,y, z} | {7 4 1 0 8} |
| 6. $\emptyset$ | |
| 7. {abril, junio, septiembre, noviembre} | 12. Las respuestas serán diversas; pero utilice cualquier conjunto con 3,4,6,12 como elementos. |
| {April, June, September, November} | |
| 8. {julio, junio} | Answers will vary, but use 3,4,6,12 as elements of the set. |
| {January, June, July} | |

EJERCIO 1-2/EXERCISE 1-2, pages 18-19

1. 1,2,4,6 
2. 0,3,6 
3. 1,2,4,5 
4. 
5. 
6. 
7. 
8. RCQ

EJERCICIO 1-3/EXERCISE 1-3, pages 28-29

1. unidades; 1
ones; 1
2. centenas de millón; 100,000,000
hundred millions; 100,000,000
3. centenas de millar; 100,000
hundred thousands; 100,000
4. decenas; 10
tens; 10
5. millares; 1,000
thousands; 1,000
6. millones; 1,000,000
millions; 1,000,000
7. seiscientos cuarenta y cinco
six hundred forty-five
8. seis mil cuatrocientos
treinta y cinco
six thousand, four hundred
thirty-five
9. veinticinco mil cuatrocientos
dieciseis
twenty-five thousand, four
hundred sixteen
10. catorce mil setecientos tres
fourteen thousand, seven
hundred three
11. diez mil novecientos ocho
ten thousand, nine hundred
eight
12. doce mil cien
twelve thousand, one hundred
13. trece mil noventa y dos
thirteen thousand, ninety-two
14. un millón seiscientos cincuenta
y ocho mil trescientos veinticinco
one million, six hundred fifty-
eight thousand, three hundred
twenty-five
15. cuatrocientos cincuenta y seis
four hundred fifty-six
16. siete mil doscientos once
seven thousand, two hundred
eleven
17. doscientos cincuenta mil
seiscientos setenta y nueve
two hundred fifty thousand, six
hundred seventy-nine
18. treinta y tres mil siete
thirty-three thousand, seven
19. dos millones seiscientos noventa
y tres mil cuatrocientos cincuenta
y siete
two million, six hundred ninety-
three thousand, four hundred
fifty-seven
20. un millón seiscientos dos mil
quinientos
one million, six hundred two
thousand five hundred
21. ochenta y cuatro mil doscientos
noventa y tres
eighty-four thousand, two
hundred ninety-three
22. veinte mil sesenta y cinco
twenty thousand, sixty-five
23. doce millones setecientos veinti-
tres mil cuatrocientos ochenta y
cinco
twelve million, seven hundred
twenty-three thousand, four
hundred eighty-five
24. un millón trescientos veintinueve
one million, three hundred
twenty-nine
25. tres millones quinientos veintiseis
mil cuatrocientos uno
three million, five hundred
twenty-six thousand, four
hundred one

EJERCICIO 1-4/EXERCISE 1-4, pages 36-37

1. 100
2. $10 \times 10 \times 10$; 1,000
3. 10,000
4. $10^6 \times 10 \times 10 \times 10 \times 10$; 100,000
5. 10^7 ; $10 \times 10 \times 10 \times 10 \times 10 \times 10$
6. 10^7 ; $10 \times 10 \times 10 \times 10 \times 10 \times 10 \times 10$
7. 10^7 ; 10,000,000
8. $10 \times 10 \times 10 \times 10 \times 10 \times 10 \times 10 \times 10$
 $\times 10$; 1,000,000,000
9. decenas; 10^1
tens; 10^1
10. unidades; 10^0
ones; 10^0
11. centenas; 10^2
hundreds; 10^2
12. decenas de millar; 10^4
ten thousands; 10^4
13. millones; 10^6
millions; 10^6
14. centenas de millar; 10^5
hundred thousands; 10^5

EJERCICIO 1-5/EXERCISE 1-5, pages 40-41

1. $(3 \times 10^2) + (4 \times 10^1) + (5 \times 10^0)$
Comprobación - Check: $(3 \times 100) + (4 \times 10) + (5 \times 1) = 345$
2. $(1 \times 10^3) + (2 \times 10^2) + (3 \times 10^1) + (4 \times 10^0)$
Comprobación - Check: $(1 \times 1,000) + (2 \times 100) + (3 \times 10) + (4 \times 1)$
 $= 1,234$
3. $(4 \times 10^3) + (5 \times 10^2) + (0 \times 10^1) + (5 \times 10^0)$
Comprobación - Check: $(4 \times 1,000) + (5 \times 100) + (0 \times 10) + (5 \times 1)$
 $= 4,505$
4. $(1 \times 10^4) + (0 \times 10^3) + (4 \times 10^2) + (8 \times 10^1) + (7 \times 10^0)$
Comprobación - Check: $(1 \times 10,000) + (0 \times 1,000) + (4 \times 100)$
 $+ (8 \times 10) + (7 \times 1) = 10,487$
5. $(5 \times 10^3) + (0 \times 10^2) + (0 \times 10^1) + (6 \times 10^0)$
Comprobación - Check: $(5 \times 1,000) + (0 \times 100) + (0 \times 10) + (6 \times 1)$
 $= 5,006$
6. $(1 \times 10^5) + (0 \times 10^4) + (7 \times 10^3) + (4 \times 10^2) + (5 \times 10^1) + (9 \times 10^0)$
Comprobación - Check: $(1 \times 100,000) + (0 \times 10,000) + (7 \times 1,000) +$
 $(4 \times 100) + (5 \times 10) + (9 \times 1) = 107,459$

EJERCICIO 1-5/EXERCISE 1-5 (Cont.) pages 40-41

7. $(1 \times 10^6) + (2 \times 10^5) + (3 \times 10^4) + (4 \times 10^3) + (5 \times 10^2) + (6 \times 10^1) + (7 \times 10^0)$

Comprobación - Check: $(1 \times 1,000,000) + (2 \times 100,000) + (3 \times 10,000) + (4 \times 1,000) + (5 \times 100) + (6 \times 10) + (7 \times 1) = 1,234,567$

8. $(1 \times 10^4) + (5 \times 10^3) + (0 \times 10^2) + (8 \times 10^1) + (2 \times 10^0)$

Comprobación - Check: $(1 \times 10,000) + (5 \times 1,000) + (0 \times 100) + (8 \times 10) + (2 \times 1) = 15,082$

9. $(7 \times 10^5) + (4 \times 10^4) + (6 \times 10^3) + (1 \times 10^2) + (2 \times 10^1) + (9 \times 10^0)$

Comprobación - Check: $(7 \times 100,000) + (4 \times 10,000) + (6 \times 1,000) + (1 \times 100) + (2 \times 10) + (9 \times 1) = 746,129$

10. $(1 \times 10^6) + (0 \times 10^5) + (0 \times 10^4) + (0 \times 10^3) + (0 \times 10^2) + (2 \times 10^1) + (0 \times 10^0)$

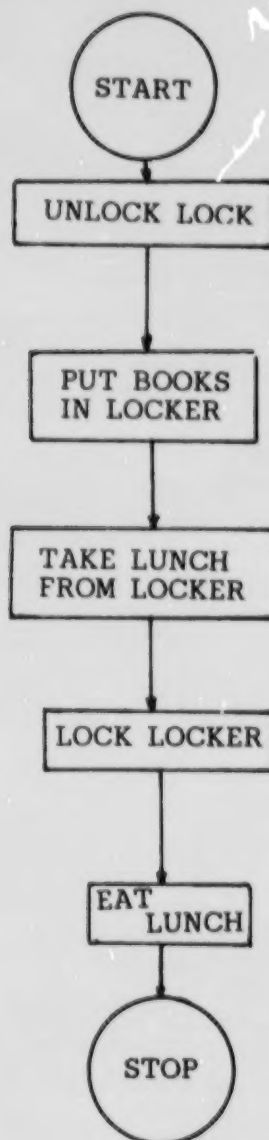
Comprobación - Check: $(1 \times 1,000,000) + (0 \times 100,000) + (0 \times 10,000) + (0 \times 1,000) + (0 \times 100) + (2 \times 10) + (0 \times 1) = 1,000,010$

EJERCICIO 1-6/EXERCISE 1-6, pages 50-51

1.



1.

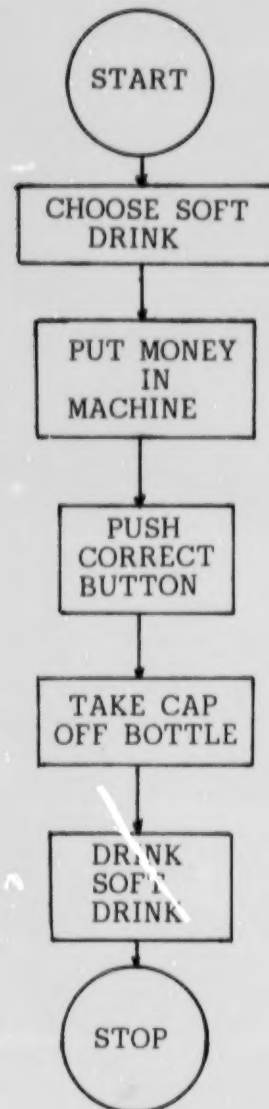


EJERCICIO 1-6/EXERCISE 1-6 (Cont.), pages 52-57

2.



2.



3. número - number
4. Orden natural - Check answer.
5. Respuestas diversas - Answers will vary.

EJERCICIO 1-7/EXERCISE 1-7, pages 66-69

- | | |
|------------------------|-----------------|
| 1. 530 | 11. 7,300 |
| 2. 3,700 | 12. 57,000 |
| 3. 48,000 | 13. 1,000,000 |
| 4. 3,815; 4,475; 3,502 | 14. 16,000,000 |
| 5. 1,700 | 15. 1,306,000 |
| 6. 1,670 | 16. 360 |
| 7. 2,900 | 17. \$2,360,000 |
| 8. 2,900 | 18. 15,000 |
| 9. 3,000 | 19. 30,000 |
| 10. 7,330 | 20. 1,700,000 |

EJERCICIO 1-8/EXERCISE 1-8, pages 74-75

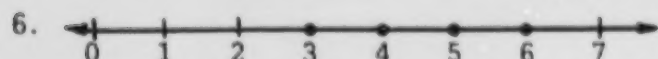
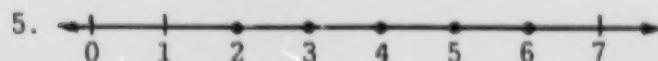
- | | |
|------------|-------------|
| 2. II | 32. XXXII |
| 6. VI | 33. XXXIII |
| 16. XVI | 34. XXXIV |
| 22. XXII | 35. XXXV |
| 24. XXIV | 37. XXXVII |
| 26. XXVI | 38. XXXVIII |
| 27. XXVII | 39. XXXIX |
| 28. XXVIII | 40. XL |
| 30. XXX | |

EJERCICIO 1-8/EXERCISE 1-8, pages 76-77

- | | |
|-----------|---------------|
| 1. 3 | 16. 1,936 |
| 2. 7 | 17. VII |
| 3. 14 | 18. XVIII |
| 4. 29 | 19. XLIX |
| 5. 100 | 20. CMXCIX |
| 6. 90 | 21. XIX |
| 7. 40 | 22. MDCCLXXVI |
| 8. 60 | 23. II |
| 9. 19 | 24. MCIV |
| 10. 2,452 | 25. MCDLXIV |
| 11. 11 | 26. LIX |
| 12. 1,100 | 27. CDVIII |
| 13. 500 | 28. XXX |
| 14. 555 | 29. MCMXXIX |
| 15. 30 | 30. MMCMLI |

REPASO 1 / REVIEW 1, pages 78-81

1. { martes, miércoles }
 { Tuesday, Thursday }
2. { 3, 4, 5 }
3. $\emptyset$

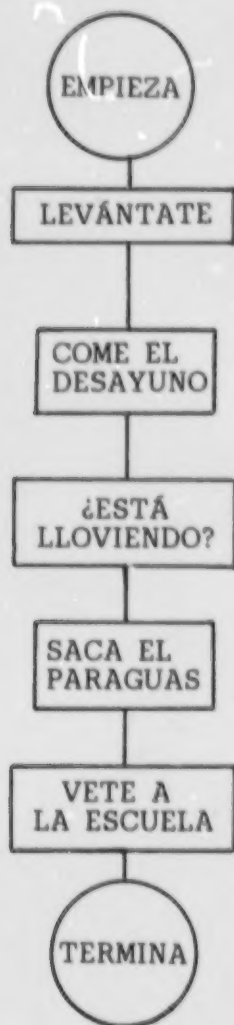


7. centenas de millar; 10^5
 hundred thousands; 10^5
8. millares; 10^3
 thousands; 10^3
9. millones; 10^6
 millions; 10^6
10. decenas; 10^1
 tens; 10^1
11. decenas de millar; 10^4
 ten thousands; 10^4
12. dos mil trescientos cincuenta y uno
 two thousand, three hundred fifty-one
13. doce mil trescientos cuarenta y seis
 twelve thousand, three hundred forty-six
14. ciento seis
 one hundred six
15. siete mil setecientos uno
 seven thousand, seven hundred one
16. dos millones trescientos cuarenta y dos mil seiscientos cincuenta y uno
 two million, three hundred forty-two thousand, six hundred fifty-one
17. $(4 \times 10^2) + (5 \times 10^1) + (3 \times 10^0)$
 Comprobación-Check: $(4 \times 100) + (5 \times 10) + (3 \times 1) = 453$
18. $(1 \times 10^3) + (5 \times 10^2) + (8 \times 10^1) + (5 \times 10^0)$
 Comprobación-Check: $(1 \times 1,000) + (5 \times 100) + (8 \times 10) + (5 \times 1) = 1,585$

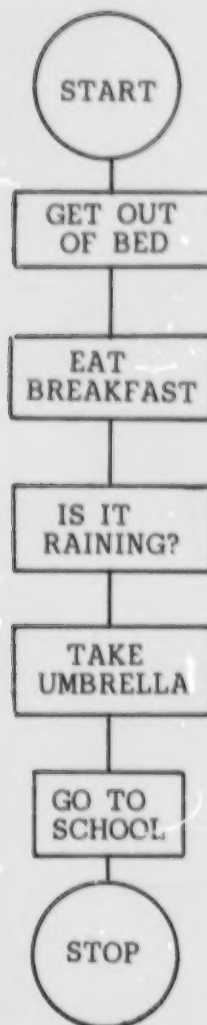
19. $(1 \times 10^4)_2 + (5 \times 10^3)_1 + (0 \times 10^2)_0 + (8 \times 10^1)_1 + (7 \times 10^0)_0$
 Comprobación-Check:
 $(1 \times 10,000) + (5 \times 1,000) + (0 \times 100) + (8 \times 10) + (7 \times 1) = 15,087$
20. 1,000
21. 1,500
22. 1,490
23. 20,000
24. 1,000,000
25. XIII
26. XLV
27. CCLXIX
28. MCMLXXVI
29. 24
30. 63
31. 636
32. 1,933

REPASO 1 / REVIEW 1, (Cont.), pages 78-81

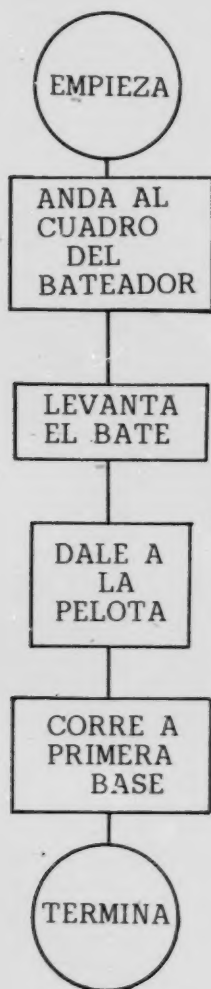
33.



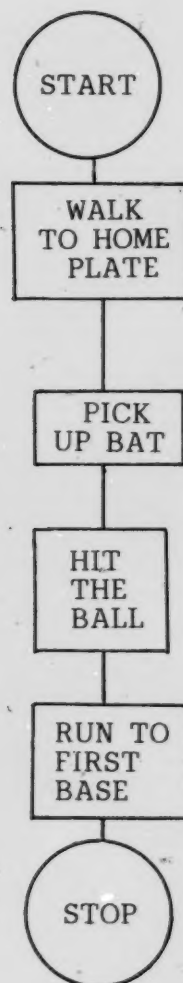
33.



34.



34.



CLAVE/ANSWER KEY

MODELOS Y ACTIVIDADES PATTERNS AND ACTIVITIES

NIVEL 1/LEVEL 1

CLAVE/ANSWER KEY

MODELOS Y ACTIVIDADES/PATTERNS AND ACTIVITIES

NIVEL 1/LEVEL 1

M1-1

1. número
2. numeral
3. número
4. número
5. numeral
6. número
7. numeral
8. número
9. numeral
10. numeral
11. a. 6

b. 8

c. 13

d. 8

e. 6

f. 3

g. 900

h. 423

i. 80

j. 10

1. number
2. numeral
3. number
4. number
5. number
6. number
7. numeral
8. number
9. numeral
10. numeral
11. a. 5

b. 8

c. 12

d. 7

e. 6

f. 3

g. 700

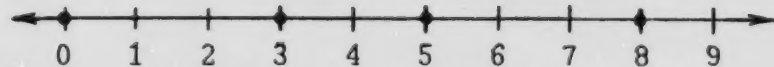
h. 306

i. 80

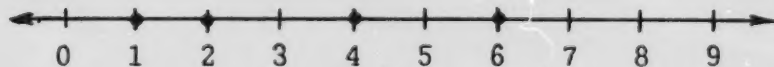
j. 10

MI-2

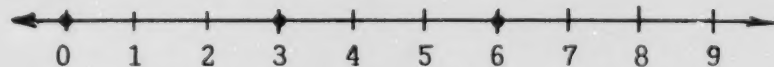
1. (0,3,5,8)

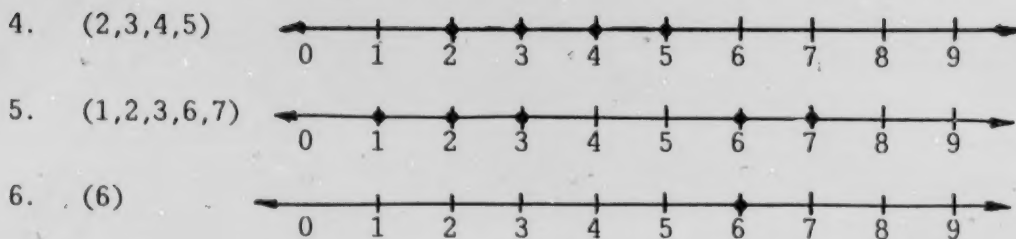


2. (1,2,4,6)

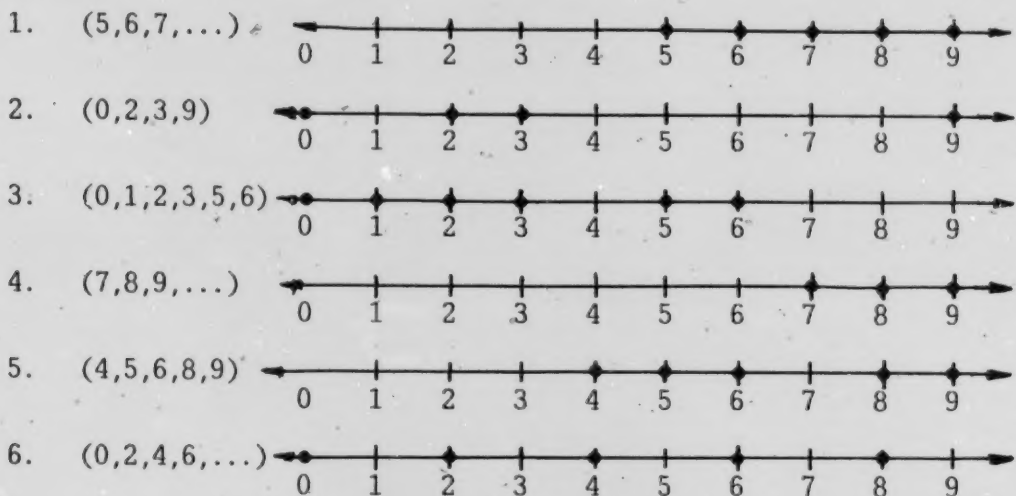


3. (0,3,6)





M1-3



M1-5

1. 2,160
2. 24,902
3. 3,000,000,000
4. 71,500
5. 238,000,855
6. 3,664,000,000
7. 10,950
8. 24,000,600
9. 205
10. 824

11. 170
12. 608
13. millones-millions
14. billones-billions
15. unidades-ones
16. millares-thousands
17. millones-millions
18. millares-thousands

M1-6

- a. decenas, 10
- b. centenas, 100
- c. decenas de millar; 10,000
- d. unidades de millar; 100,000
- e. centenas de millar; 100,000
- f. millones; 1,000,000
- g. decenas de millar; 10,000
- h. decenas de millón; 10,000,000

- a. tens, 10
- b. hundreds, 100
- c. ten thousands; 10,000
- d. thousands; 1,000
- e. hundred thousands; 100,000
- f. millions; 1,000,000
- g. ten thousands; 10,000
- h. ten millions; 10,000,000

M1-8

- | | |
|--|---------------------------------|
| 1. $10 \times 10 = 100$ | 9. 20,000,000,000 |
| 2. $10 \times 10 \times 10 \times 10 = 10,000$ | 10. 100,000,000 |
| 3. $10 \times 10 \times 10 \times 10 \times 10 \times 10 \times 10 = 10,000,000$ | 11. 100,000,000,000 |
| 4. 1,000,000,000,000,000,000 | 12. 100,000,000,000,000 |
| 5. 1,000,000 | 13. 100,000,000,000,000,000,000 |
| 6. 10,000,000,000,000,000 | 14. 1,000,000,000 |
| 7. 100,000 | 15. 1,000,000,000,000 |
| 8. 1,000 | |

M1-9

- $(7 \times 100) + (5 \times 10) + (2 \times 1)$
- $(6 \times 1,000) + (2 \times 100) + (9 \times 10) + (5 \times 1)$
- $(4 \times 1,000) + (1 \times 100) + (0 \times 10) + (6 \times 1)$
- $(8 \times 10,000) + (3 \times 1,000) + (7 \times 100) + (3 \times 10) + (9 \times 1)$
- $(9 \times 10,000) + (5 \times 1,000) + (0 \times 100) + (4 \times 10) + (0 \times 1)$
- $(3 \times 10,000) + (6 \times 10,000) + (8 \times 1,000) + (7 \times 100) + (1 \times 10) + (4 \times 1)$
- $(2 \times 1,000,000) + (5 \times 100,000) + (3 \times 10,000) + (0 \times 1,000) + (7 \times 100) + (8 \times 10) + (6 \times 1)$
- $(6 \times 10,000,000) + (0 \times 1,000,000) + (9 \times 100,000) + (1 \times 10,000) + (8 \times 1,000) + (2 \times 100) + (4 \times 10) + (1 \times 1)$

M1-10

- $(8 \times 10^2) + (6 \times 10^1) + (4 \times 10^0)$
 $8 \times 100 + (6 \times 10) + (4 \times 1) = 864$
- $(9 \times 10^3) + (2 \times 10^2) + (0 \times 10^1) + (5 \times 10^0)$
 $9 \times 1,000 + 2 \times 100 + (0 \times 10) + (5 \times 1) = 9,205$
- $(1 \times 10^5) + (0 \times 10^4) + (3 \times 10^3) + (9 \times 10^2) + (8 \times 10^1) + (4 \times 10^0)$
 $(1 \times 100,000) + (0 \times 10,000) + (3 \times 1,000) + (9 \times 100) + (8 \times 10) + (4 \times 1) = 103,984$
- $(1 \times 10^3) + (6 \times 10^2) + (0 \times 10^1) + (7 \times 10^0)$
 $(1 \times 1,000) + (6 \times 100) + (0 \times 10) + (7 \times 1) = 1,607$
- $(1 \times 10^6) + (3 \times 10^5) + (9 \times 10^4) + (2 \times 10^3) + (6 \times 10^2) + (5 \times 10^1) + (7 \times 10^0)$
 $(1 \times 1,000,000) + (3 \times 100,000) + (9 \times 10,000) + (2 \times 1,000) + (6 \times 100) + (5 \times 10) + (7 \times 1) = 1,392,657$
- $(3 \times 10^4) + (5 \times 10^3) + (6 \times 10^2) + (9 \times 10^1) + (8 \times 10^0)$
 $(3 \times 10,000) + (5 \times 1,000) + (6 \times 100) + (9 \times 10) + (8 \times 1) = 35,698$
- $(9 \times 10^6) + (2 \times 10^5) + (0 \times 10^4) + (4 \times 10^3) + (3 \times 10^2) + (4 \times 10^1) + (1 \times 10^0)$
 $(9 \times 1,000,000) + (2 \times 100,000) + (0 \times 10,000) + (4 \times 1,000) + (3 \times 100) + (4 \times 10) + (1 \times 1) = 9,204,341$

$$8. \quad (4 \times 10^7) + (8 \times 10^6) + (7 \times 10^5) + (5 \times 10^4) + (3 \times 10^3) + (2 \times 10^2) + (1 \times 10^1) + (1 \times 10^0) + (4 \times 10,000,000) + (8 \times 1,000,000) + (7 \times 100,000) + (5 \times 10,000) + (3 \times 1,000) + (2 \times 100) + (1 \times 10) + (1 \times 1) = 48,753,211$$

M1-11

280
400
7,000
3,000,000

M1-12

1. 4,700
2. 4,670
3. 88,000
4. 7,600
5. 4,000,000
6. 2,900
7. 2,870
8. 2,900
9. 7,330
10. 7,300
11. 40,000
12. 800,000

M1-13

1. 16
2. 20
3. 13
4. 230
5. 1,100
6. 67
7. 1,650
8. 75
9. 8
10. 11

M1-14

1. 9
2. 900
3. 14
4. 42
5. 69
6. 994
7. 444
8. 29
9. 403
10. 50

CLAVE/ANSWER KEY

EXÁMENES/TESTS

NIVEL 1/LEVEL 1

CLAVE/ANSWER KEY

EXAMEN 1/TEST 1

NIVEL 1/LEVEL 1

1. decenas de millar; 10,000
ten thousands; 10,000

2. centenas; 100
hundreds; 100

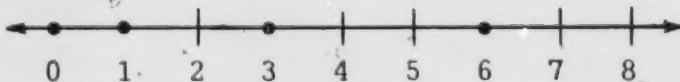
3. millones; 1,000,000
millones; 1,000,000

4. unidades; 1
ones; 1

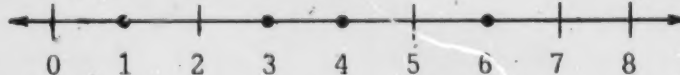
5. {4, 5, 6}

6. {marzo, mayo}
{March, May}

7. {0, 1, 3, 6}



8. {1, 3, 4, 6}



9.

A horizontal number line with arrows at both ends, marked from 0 to 8. Points are plotted at 3, 4, 5, 6, and 7.

10. ciento seis
one hundred six

11. siete mil setecientos cuarenta y tres
seven thousand, seven hundred forty-three

12. doce mil trescientos noventa
twelve thousand, three hundred ninety

13. siete mil ochocientos cuarenta y un mil novecientos treinta y dos
seven million, eight hundred forty-one thousand, nine hundred thirty-two

14. $(7 \times 100) + (9 \times 10) + (4 \times 1)$ or $(7 \times 10^2) + (9 \times 10^1) + (4 \times 10^0)$

15. $(3 \times 1,000) + (0 \times 100) + (5 \times 10) + (0 \times 1)$ or
 $(3 \times 10^3) + (0 \times 10^2) + (5 \times 10^1) + (0 \times 10^0)$

16. 2,000
17. 1,800
18. 1,780
19. 9,000,000
20. XII

21. XLIII
22. CCLXXV
23. 26
24. 92
25. 1,255

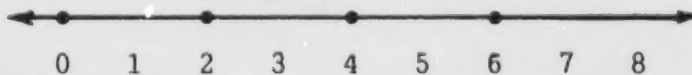
CLAVE/ANSWER KEY

EXAMEN 2/TEST 2

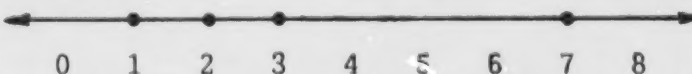
NIVEL 1/LEVEL 1

1. {2, 3, 4}
2. {junio, julio}
{January, June, July}
3. centenas; 100
hundreds; 100
4. decenas de millar; 10,000
ten thousands; 10,000
5. decenas; 10
tens; 10
6. millones; 1,000,000
millions; 1,000,000
7. ciento noventa
one hundred ninety
8. seis mil seiscientos cuarenta y cinco
six thousand, six hundred forty-five
9. trece mil cuatrocientos nueve
thirteen thousand, four hundred nine
10. ocho millones cuatrocientos noventa y cuatro mil trescientos veintiuno
eight million, four hundred ninety-four thousand, three hundred twenty-one
11. $(9 \times 100)_0 + (0 \times 10) + (4 \times 1)$ o (or) $(9 \times 10^2) + (0 \times 10^1) + (4 \times 10^0)$
12. $(3 \times 1000) + (4 \times 100) + (5 \times 10) + (2 \times 1)_0$ o (or) $(3 \times 10^3) + (4 \times 10^2) + (5 \times 10^1) + (2 \times 10^0)$

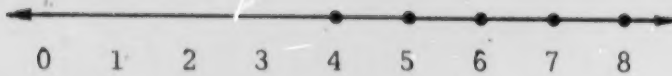
13. (0, 2, 4, 6)



14. (1, 2, 3, 7)



15.



16. 29

17. 76

18. 602

19. XLV

20. XVIII

21. CCCXCII

22. 1,000

23. 1,500

24. 1,490

25. 8,000,000

MODELOS Y ACTIVIDADES
PATTERNS AND ACTIVITIES

NIVEL 1 /LEVEL 1

NÚMERO Y NUMERAL

Escribe la palabra correcta en cada espacio en blanco: número o numeral.

1. Si estoy pensando en 5 manzanas, 5 es un _____.
2. Si escribo el símbolo 5, este símbolo escrito es un _____.
3. Si estoy pensando en 3 carros, 3 es un _____.
4. Si tengo en cuenta que hay 4 hojas de papel en mi cuaderno, 4 es un _____.
5. Si un señor escribe un cheque de \$8.00, el "8" en la expresión "\$8.00" es un _____.
6. Si Roberto está pensando en 16 helados, 16 es un _____.
7. Al completar una forma de aplicación, si escribo mi edad como 12, 12 es un _____.
8. Si Anita está pensando en 6 gatitos, 6 es un _____.
9. Si pongo la figura 23 en el pizarrón, 23 es un _____.
10. Si escribo un 9, 9 es un _____.
11. ¿Cuál número es el mayor?
Which number is larger?

- | | | |
|----|----|----|
| a. | 5 | 6 |
| b. | 8 | 8 |
| c. | 12 | 13 |

NUMBER AND NUMERAL

Give the correct word for each blank: number or numeral.

1. If I am thinking of 5 apples, 5 is a _____.
2. If I write the symbol 5, this written symbol is a _____.
3. If I am thinking of 3 cars, 3 is a _____.
4. If I know that there are 4 sheets of paper in my notebook, 4 is a _____.
5. If a man writes a check for \$8.00 the "8" is the expression "\$8.00" is a _____.
6. If Roberto is thinking about 16 ice cream cones, 16 is a _____.
7. While filling out an application form, if I write my age as 12, 12 is a _____.
8. If Anita is thinking about 6 kittens, 6 is a _____.
9. If I place the figure 23 on the chalkboard, 23 is a _____.
10. If I write a 9, 9 is a _____.
11. ¿Cuál numeral es el mayor?
Which numeral is larger?

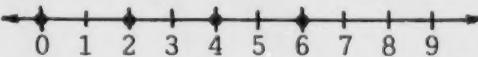
- | | | |
|----|----|----|
| a. | 5 | 6 |
| b. | 8 | 3 |
| c. | 12 | 13 |

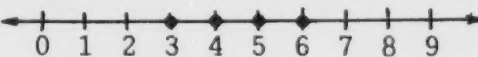
d.	7	8
e.	6	5
f.	3	1
g.	700	900
h.	306	423
i.	80	70
j.	10	9

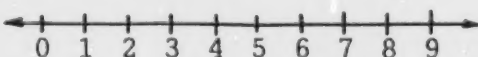
d.	7	8
e.	6	5
f.	3	1
g.	700	900
h.	306	423
i.	80	70
j.	10	9

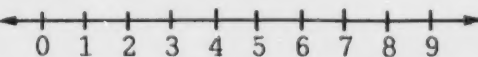
M1 - 2

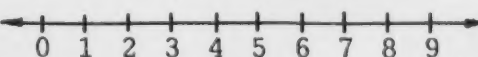
CONJUNTO DE NÚMEROS SET OF NUMBERS	EN ORDEN NATURAL IN NATURAL ORDER	GRAFICA GRAPH
--	--	------------------

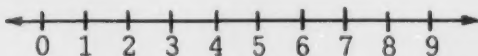
Ex. a. (0, 2, 4, 6) (0, 2, 4, 6) 

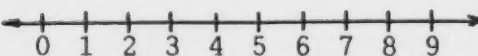
Ex. b. (6, 5, 4, 3) (3, 4, 5, 6) 

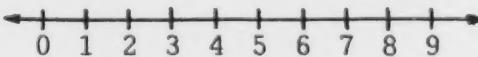
1. (5, 0, 3, 8) 

2. (6, 4, 2, 1) 

3. (3, 0, 6) 

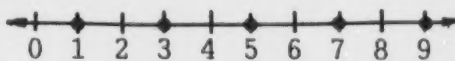
4. (los números enteros entre 1 y 6) (the whole numbers between 1 and 6) 

5. (3, 1, 6, 2, 7) 

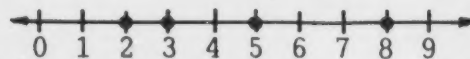
6. (los números enteros entre 5 y 7) (the whole numbers between 5 and 7) 

CONJUNTO DE NÚMEROS	EN ORDEN NATURAL IN NATURAL ORDER	GRÁFICA GRAPH
SET OF NUMBERS		

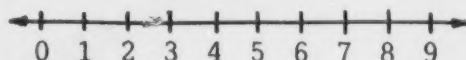
Ex. a. (los números enteros im-
pares) (1, 3, 5, 7, 9,...)
(the odd whole numbers)



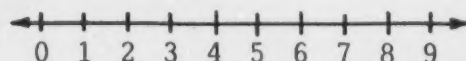
Ex. b. (2, 8, 0, 3, 5) (0, 2, 3, 5, 8)



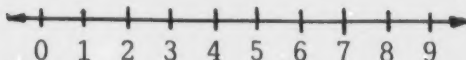
1. (5, 6, 7,...)



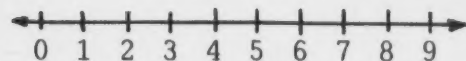
2. (0, 2, 9, 3)



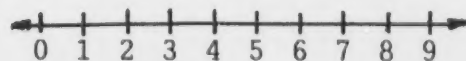
3. (5, 2, 1, 0, 6, 3)



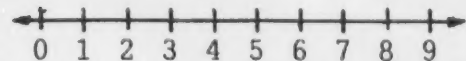
4. (7, 8, 9,...)



5. (9, 8, 6, 5, 4)



6. (los números enteros pares)
(the even whole numbers)



Billones			Millones			Millares			Unidades		
Billons			Millions			Thousands			Ones		
centenas de billón	decenas de billón	unidades de billón	centenas de millón	decenas de millón	unidades de millón	centenas de millar	decenas de millar	unidades de millar	centenas	decenas	unidades simples
hundred billions	ten billions	one billions	hundred millions	ten millions	one millions	hundred thousands	ten thousands	one thousands	hundreds	tens	ones
8	9	7	2	1	5	3	4	6			

NOMBRE-NAME _____

HOJA DE TRABAJO-WORKSHEET

Clase →	Billones			Millones			Millares			Unidades		
Period →	Billions			Millions			Thousands			Ones		
Place →	hundred billions			ten billions			one billions			hundred millions		
	centenas de billón			decenas de billón			unidades de billón			centenas de millón		
	ten thousands			one thousands			hundreds			tens		
	one millions			hundred thousands			centenas			decenas		
	ten millions			one millions			unidades simples					
Posición →	centenas de millar			decenas de millar			unidades de millar					
	one thousands			one thousands								
	hundred thousands			hundred thousands								
	one millions			one millions								
	ten millions			ten millions								
	hundred millions			hundred millions								
	one billions			one billions								
	ten billions			ten billions								
	hundred billions			hundred billions								
Numeral	3	4	9	8	0	2	6	7	1	5	2	4

NUMERÓS GRANDES

Las expresiones numéricas subrayadas son aproximaciones. Escribe las en numerales.

- El diámetro de la tierra tiene dos mil ciento sesenta millas.
- La circunferencia de la tierra mide veinticuatro mil novecientos dos millas.
- Algunas de las rocas de la tierra tienen tres billones de años.
- El diámetro de Saturno tiene setenta y un mil quinientas millas.

LARGE NUMBERS

The underlined numerical expressions are approximations. Write them in numerals.

- The diameter of the earth is two thousand, one hundred sixty miles.
- The circumference of the earth is twenty-four thousand, nine hundred two miles.
- Some of the earth's rocks are three billion years old.
- The diameter of Saturn is seventy-one thousand, five hundred miles.

5. La distancia de la tierra a la luna es de doscientos treinta y ocho millones ochocientas cincuenta y cinco millas.
6. La distancia desde Neptun hasta el sol es de tres billones seiscientos sesenta y cuatro millones de millas.
7. Saturno tarda diez mil novecientos cincuenta días en dar una vuelta alrededor del sol.
8. La distancia de la tierra a Venus es veinticuatro millones seiscientas millas.

En los espacios en blanco escribe las cifras que ocupan el lugar de los millares en cada uno de los numerales siguientes.

9. 2,648,205,652 _____

10. 58,824,026 _____

11. Escribe las cifras que en el numeral siguiente se encuentran en la clase de los millones:
6,170,682,004 _____

12. Escribe las cifras que en el numeral siguiente ocupan la clase de las unidades: _____
208,023,475,608 _____

En el numeral 8,375,940,162

13. El 7 está en la clase de las/ los _____.
14. El 8 está en la clase de las/ los _____.

5. The distance from the earth to the moon is two hundred thirty-eight million eight hundred fifty-five miles.
6. The distance from Pluto to the sun is three billion, six hundred sixty-four million miles.
7. The time required for Saturn to orbit the sun is ten thousand, nine hundred fifty days.
8. The distance from the earth to Venus is twenty-four million, six hundred miles.

In the blank, write the digits in the thousands place of each numeral.

11. List the digits in the millions period of the numeral _____
6,170,682,004. _____

12. List the digits in the ones period of the numeral _____
208,023,475,608. _____

In the numeral 8,375,940,162

13. The 7 is in the _____ period.
14. The 8 is in the _____ period.

15. El 6 está en la clase de las/
los _____.
16. El 0 está en la clase de las/
los _____.
17. El 5 está en la clase de las/
los _____.
18. El 9 está en la clase de las/
los _____.

15. The 6 is in the _____
period.
16. The 0 is in the _____
period.
17. The 5 is in the _____
period.
18. The 9 is in the _____
period.

M1 - 6

NOMBRE-NAME _____

Escribe la palabra y el número que faltan.

Ejemplo:

2,836: El 8 en la posición de las centenas significa 8 X 100.

a. 641: El 4 en la posición de las _____ significa 4 X _____.

b. 945: El 9 en la posición de las _____ significa 9 X _____.

c. 68,283: El 6 en la posición de las _____ significa 6 X _____.

d. 132,718: El 2 en la posición de las _____ significa 2 X _____.

e. 5,648,930: El 6 en la posición de las _____ significa 6 X _____.

f. 7,090,400: El 6 en la posición de las _____ significa 7 X _____.

g. 4,525,813: El 2 en la posición de las _____ significa 2 X _____.

h. 37,651,000: El 3 en la posición de las _____ significa 3 X _____.

HOJA DE TRABAJO-WORKSHEET

Give the missing word and number.

Example:

2,836: The 8 in the hundreds place means 8 X 100.

a. 641: the 4 in the _____ place means 4 X _____.

b. 945: The 9 in the _____ place means 4 X _____.

c. 68,283: The 6 in the _____ place means 6 X _____.

d. 132,718: The 2 in the _____ place means 2 X _____.

e. 5,648,930: The 6 in the _____ place means 6 X _____.

f. 7,090,400: The 7 in the _____ place means 7 X _____.

g. 4,525,813: The 2 in the _____ place means ? X _____.

h. 37,651,000: The 3 in the _____ place means 3 X _____.

M1 - 7

Billones			Millones			Millares			Unidades		
Billions			Millions			Thousands			Ones		
11	10	9	8	7	6	5	4	3	2	1	
10	10	10	10	10	10	10	10	10	10	10	1
			6	8	1	3	4	5	2	5	7

--	--	--	--	--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--	--	--	--	--

NOMBRE-NAME _____

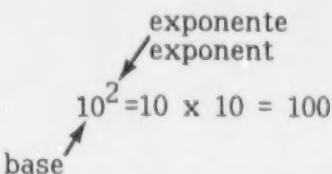
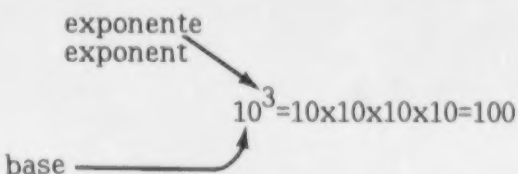
HOJA DE TRABAJO-WORKSHEET

EXPONENTS

EXPONENTS

Regla: El exponente indica las veces que se usa la base como factor.

Rule: The exponent shows how many times the base is used as a factor.

Ejemplos	Examples
 $10^2 = 10 \times 10 = 100$	 $10^3 = 10 \times 10 \times 10 \times 10 = 100$

¿Te has fijado que el número de ceros en el numeral es el mismo que el exponentes?

Have you noticed that the number of zeros in the numeral is the same as the exponent?

Instrucciones: Escribe en forma de numerales decimales.

Directions: Write in the form of decimal numerals.

- $10^2 = 10 \times 10 = 100$ _____
- $10^4 =$ _____
- $10^7 =$ _____
- $10^{18} =$ _____
- $10^6 =$ _____
- $10^{16} =$ _____
- $10^5 =$ _____
- $10^3 =$ _____
- $10^{10} =$ _____
- $10^8 =$ _____

11. $10^{11} =$ _____
12. $10^{14} =$ _____
13. $10^{20} =$ _____
14. $10^9 =$ _____
15. $10^{12} =$ _____

NOMBRE-NAME

HOJA DE TRABAJO-WORKSHEET

Escribe cada numeral en notación desarrollada.

Write each numeral in expanded notation.

Ejemplo - Example

$$643 = (6 \times 100) + (4 \times 10) + (3 \times 1)$$

1. 752 = _____ + _____ + _____
2. 6,295 = _____ + _____ + _____ + _____
3. 4,106 = _____ + _____ + _____ + _____
4. 83,739 = _____ + _____ + _____ + _____
5. 95,040 = _____ + _____ + _____ + _____
6. 368,714 = _____ + _____ + _____ + _____
7. 2,530,786 = _____ + _____ + _____ + _____ + _____
8. 60,918,241 = _____ + _____ + _____ + _____ + _____

M1 - 10

NOMBRE-NAME _____

HOJA DE TRABAJO-WORKSHEET

Escribe estos numerales en notación desarrollada, usando exponentes y compruébalos.

Write these numerals in expanded notation with exponents and check.

Ejemplo - Example

$$24,365 = (2 \times 10^4) + (4 \times 10^3) + (3 \times 10^2) + (6 \times 10^1) + (5 \times 10^0)$$

$$\text{COMPROBACIÓN: } (2 \times 10,000) + (4 \times 1,000) + (3 \times 100) + (6 \times 10) + (5 \times 1) = 24,365$$

CHECK:

1. 864 = _____
COMPROBACIÓN: _____
CHECK: _____
2. 9,205 = _____
COMPROBACIÓN: _____
CHECK: _____
3. 103,984 = _____
COMPROBACIÓN: _____
CHECK: _____
4. 1,607 = _____
COMPROBACIÓN: _____
CHECK: _____
5. 1,392,657 = _____
COMPROBACIÓN: _____
CHECK: _____
6. 35,698 = _____
COMPROBACIÓN: _____
CHECK: _____
7. 9,204,341 = _____
COMPROBACIÓN: _____
CHECK: _____
8. 48,753,211 = _____
COMPROBACIÓN: _____
CHECK: _____

REDONDEANDO NÚMEROS

Para redondear un número, fíjate en la cifra que está a la derecha de la posición a la que se va a redondear. (A esta cifra llámale cifra de prueba)

Si la cifra de prueba es 5 o mayor, añade 1 a la cifra que está en la posición a la que se va a redondear el número.

Si la cifra de prueba es menor que 5, no cambies la cifra que está en la posición a la que se quiere redondear. Hecho esto, convierte en ceros todas las cifras que queden a la derecha de la posición a la que se va a redondear.

ROUNDING NUMBERS

To round a number, look at the digit on the right of the place to which it is to be rounded. (Call this digit a test digit.)

If the test digit is five or more, add 1 to the digit that is in the place to which you are rounding the number.

If the test digit is less than 5, do not change the digit that is in the place to which you are rounding the number. Replace with zeros all the digits that are to the right of the place to which you are rounding the number.

$\overset{\wedge}{275}$ (a la decena más próxima) $\hat{=}$
(to the nearest ten)

$\overset{\wedge}{389}$ (a la centena más próxima) $\hat{=}$ _____
(to the nearest hundred)

$\overset{\wedge}{7,321}$ (al millar más próximo) $\hat{=}$ _____
(to the nearest thousand)

$\overset{\wedge}{2,756,418}$ (al millón más próximo) $\hat{=}$ _____
(to the nearest million)

NOMBRE-NAME _____

HOJA DE TRABAJO-WORKSHEET

Ejemplo 1. Redondea 52,459 al millar más próximo.

Example 1. Round 62,459 to the nearest thousand.

Pon un signo de intercalación señalando la posición a la que quieres redondear el número; subraya la cifra inmediatamente a la derecha de la posición. (Esta cifra se llama cifra de prueba.) Puesto que la cifra de prueba, 4, es menor que 5, no cambies la cifra 2. Convierte en ceros todas las cifras a la derecha del 2.

Put a caret pointing to the place to which you are rounding the number, and underline the digit to the right of that place. (This digit is called a test digit.)

Since the test digit, 4, is less than 5, leave the digit 2 unchanged. Replace with zeros all the digits to the right of 2.

Respuesta: 52,459 (al millar más próximo) = 52,000
(to the nearest thousand)

Ejemplo 2. Redondea 62,759 al millar más próximo.

Example 2. Round 62,759 to the nearest thousand.

Puesto que la cifra de prueba, 7, es mayor que 5, añade la cifra 2, convirtiéntola en 3. Convierte en ceros todas las cifras que están a la derecha del 3.

Since the test digit, 7, is more than 5, add 1 to the digit 2, changing it to 3. Replace with zeros all the digits that are to the right of 3.

Respuesta: 62,759 (al millar más próximo) = 63,000
(to the nearest thousand)

Redondea a la posición indicada los números siguientes.

Round the following numbers to the place indicated.

1. 4,672 (a la centena más próxima) $\hat{=}$ _____
 $\wedge$ (to the nearest hundred)
2. 4,672 (a la decena más próxima) $\hat{=}$ _____
 $\wedge$ (to the nearest ten)
3. 87,584 (al millar más próximo) $\hat{=}$ _____
 $\wedge$ (to the nearest thousand)
4. 7,584 (a la centena más próxima) $\hat{=}$ _____
 $\wedge$ (to the nearest hundred)

5. 3,654,327 (al millón más próximo) $\dot{=}$ _____
 $\wedge$ (to the nearest million)
6. 2,865 (a la centena más próxima) $\dot{=}$ _____
 $\wedge$ (to the nearest hundred)
7. 2,865 (a la decena más próxima) $\dot{=}$ _____
 $\wedge$ (to the nearest ten)
8. 2,865 (a la centena más próxima) $\dot{=}$ _____
 $\wedge$ (to the nearest hundred)
9. 7,327 (a la decena más próxima) $\dot{=}$ _____
 $\wedge$ (to the nearest ten)
10. 7,327 (a la centena más próxima) $\dot{=}$ _____
 $\wedge$ (to the nearest hundred)
11. 43,165 (a la decena de millar más próxima) = _____
 $\wedge$ (to the nearest ten thousand)
12. 789,342 (a la centena de millar más próxima) = _____
 $\wedge$ (to the nearest hundred thousand)

NUMERALES ROMANOS
ROMAN NUMERALS

I V X L C D M

NÚMERO REPRESENTADO
NUMBER REPRESENTED

1 5 10 50 100 500 1,000

Regla 1. Si los numerales romanos representan números que están en orden descendente (de mayor a menor) de izquierda a derecha, se suman sus valores para obtener el número representado.

Rule 1. If the Roman numerals represent numbers that are in descending order (largest to smallest) from left to right, add their values to obtain the number represented.

Ejemplos	Examples
$XV = 10 + 5 = 15$ $XV = 15$	$LXIII = 50 + 10 + 1 + 1 + 1$ $LXIII = 63$

Representa los numerales romanos siguientes en numerales decimales.

Using decimal numerals, name each number.

1. XVI = _____
2. XX = _____
3. XIII = _____
4. CCXXX = _____
5. MC = _____

6. LXVII = _____
7. MDCL = _____
8. LXXV = _____
9. VIII = _____
10. XI = _____

NUMERALES ROMANOS ROMAN NUMERALS

NÚMERO REPRESENTADO NUMBER REPRESENTED

I	V	X	L	C	D	M
1	5	10	50	100	500	1,000

Regla 2. Si el numeral romano que representa un número menor aparece a la izquierda de otro que representa un número mayor, se resta el menor del mayor. El resultado se añade después al resto de los numerales.

Rule 2. If a Roman numeral representing a smaller number appears to the left of one representing a larger number, subtract the smaller from the larger. Then add the result to the remaining numerals.

Ejemplos	Examples
$\begin{aligned} \text{LIX} &= \text{L} + (\text{X}-\text{I}) \\ &= 50 + (10-1) \\ &= 50 + 9 \\ &= 59 \end{aligned}$	$\begin{aligned} \text{CMV} &= (\text{M}-\text{C}) + \text{V} \\ &= (1000-100) + 5 \\ &= 900 + 5 \\ &= 905 \end{aligned}$

Representa en numerales decimales los numerales romanos siguientes.

- IX = _____
- CM = _____
- XIV = _____
- XLII = _____
- LXIX = _____

Using decimal numerals, name each number.

- CMXCIV = _____
- CDXLIV = _____
- XXIX = _____
- CDIII = _____
- L = _____

PAGES 79-94 MISSING FROM DOCUMENT PRIOR TO ITS
BEING SHIPPED TO EDRS FOR FILMING.

EXÁMENES /TESTS

NIVEL 1/LEVEL 1

PROCEDURE

Usando un problema de suma, introduzca los términos sumando y suma. Al enseñar Nivel 2, emplee estos términos muchas veces para que el estudiante llegue a acostumbrarse a ellos.

Ponga un grupo de dos bolitas y después un grupo de tres bolitas en un trozo de hilo. En otro trozo, ponga un grupo de tres bolitas y después un grupo de dos bolitas. Luego permita que un estudiante cuente el número de bolitas en cada trozo de hilo. Los estudiantes deben ver que hay el mismo total de bolitas en cada hilo. Después defina la propiedad conmutativa de la adición.

Usando objetos concretos, muestre ejemplos de la suma de números de una cifra. Por ejemplo, permita que un estudiante ponga un montoncito de cuatro frijoles y un montoncito de cinco frijoles en la mesa. Luego, permita que junte los montones formando uno solo con un total de nueve frijoles.

Using an addition problem, introduce the terms addend and sum. While teaching Level 2A, use these terms repeatedly so that the students will become accustomed to hearing them.

Place a group of two beads followed by a group of three beads on one piece of twine. On the other piece, place a group of three beads followed by a group of two beads. Then have a student count the number of beads on each piece of twine. The students should see that there are the same number of beads on each piece. Then define the commutative property of addition.

Show examples of addition of one-digit numbers by using concrete objects. For example, have a student place a pile of five beans on the table. Then have him make a pile of four beans. Now have him put the piles together, making a pile of nine beans in all.

ADDING MORE NUMBERS (ASSOCIATIVE PROPERTY)

ADDING SEVERAL NUMBERS

LESSONS 2A-3, 2A-4

Student Booklet p. 11

CONCEPTS

Associative property of addition

Identity property of addition

Addition of whole numbers with no regrouping (carrying)

RESOURCES

1. Two pieces of twine or string, and beads which will fit onto the twine easily (Knot only one end of each piece of twine so that the beads can be slipped on or off the other end.)
2. Ice cream sticks, toothpicks, beans or beads which can be used for illustrating addition facts (If ice cream sticks or similar items are used, they can be painted different colors to represent the decimal places, such as ones, tens, and hundreds.)
3. Teacher-made transparency showing addition of 2- and 3-digit numbers.

VOCABULARY

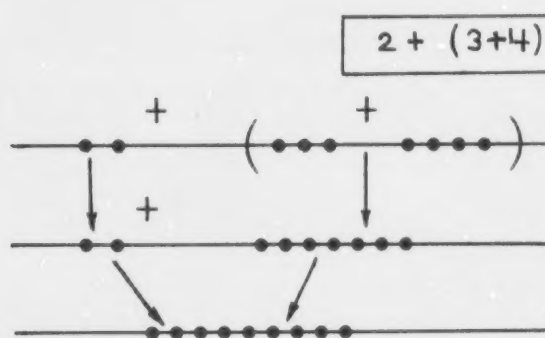
agrupación
elemento de identidad
propiedad asociativa
propiedad de identidad
reagrupación

grouping
identity element
associative property
identity property
regrouping

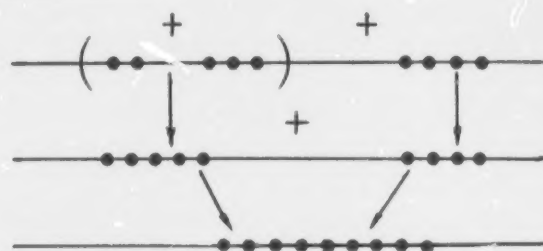
PROCEDURE

Para demostrar la propiedad asociativa, ponga bolitas en dos trozos de hilo, como se muestra en el diagrama siguiente.

To illustrate the associative property, place beads on two pieces of twine, as shown in the following diagram



Escriba la propiedad en la pizarra usando palabras, y después demuéstrela, usando números.



Write the property on the board in words and then illustrate it, using numbers.

Ejemplo

$$\begin{array}{r} 2 + (3 + 4) \\ 2 + 7 \\ 9 \end{array} = \begin{array}{r} (2 + 3) + 4 \\ 5 + 4 \\ 9 \end{array}$$

Example

Explique lo que quiere decir la propiedad de identidad de la adición. Puede demostrarla usando el hilo y las bolitas o los frijoles. Indique que el cero se llama el elemento de identidad de la adición.

Explain what is meant by the identity property of addition. You may wish to illustrate it by making use of the twine and beads or beans. Point out that zero is called the identity element for addition.

Para presentar la suma de números de dos cifras y de tres cifras, use una transparencia hecha por la maestra.

To present addition of two-digit and three-digit numbers, use a teacher-made transparency.

El uso de uno de los siguientes métodos puede ayudar a los estudiantes a comprender la función del valor de posición en la suma de números enteros.

Using one of the following methods many help the students understand the function of place value in the addition of whole numbers.

Método 1

Method 1

Pida a los estudiantes que volten una hoja de papel en posición horizontal y que rotulen las columnas formadas por las líneas del papel y después sumen.

Have the students turn their notebook paper sideways, label the columns formed by the lines of the paper, and then add.

unidades - ones	4	5	9
decenas - tens	2	4	6
centenas - hundreds	3	2	5
		+	

Método 2

Method 2

Haga que los estudiantes usen notación desarrollada en problemas de suma.

Have the students use expanded notation when they add.

Ejemplo-Example

$$\begin{array}{r} 324 = 3 \text{ centenas} + 2 \text{ decenas} \\ \quad + 4 \text{ unidades} \\ +245 = 2 \text{ centenas} + 2 \text{ decenas} \\ \quad + 5 \text{ unidades} \\ \hline 5 \text{ centenas} + 4 \text{ decenas} \\ + 9 \text{ unidades} = 569 \end{array}$$

$$\begin{array}{r} 324 = 3 \text{ hundreds} + 2 \text{ tens} + 4 \text{ ones} \\ +245 = 2 \text{ hundreds} + 4 \text{ tens} + 5 \text{ ones} \\ \hline 5 \text{ hundreds} + 6 \text{ tens} + 9 \text{ ones} \\ = 569 \end{array}$$

ADDING BY REGROUPING (CARRYING)

SOME HELPFUL HINTS

MORE PRACTICE

LESSONS 2A-5, 2A-6a, 2A-7

Student Booklet p. 21

CONCEPT

Addition by regrouping (carrying)

VOCABULARY

centenas
decenas
forma compacta
forma desarrollada
reagrupación
suma (adición)
suma
sumando
unidades

hundreds
tens
short form
expanded form
regrouping
addition
sum
addend
ones

RESOURCES

1. Beans and three boxes (each box labeled on top with a place value: centenas - hundreds, decenas - tens, unidades - ones)
2. Ice cream sticks, toothpicks, beans or beads which can be used for illustrating addition facts (If ice cream sticks or similar items are used, they can be painted different colors to represent the decimal places, such as ones, tens, and hundreds.)
3. Teacher-made transparencies showing regrouping in addition

PROCEDURE

Antes de presentar la suma por reagrupación, repase cuántas unidades contiene una decena, cuántas decenas contiene una centena, etc.

Puede demostrarlo efectivamente usando dinero. Una transparencia hecha por la maestra será útil.

Emplee cualesquiera de los métodos siguientes que sean útiles para explicar a los estudiantes el concepto de la suma por reagrupación y para hacerles practicar la operación de suma.

Método 1

Una transparencia hecha por la maestra que emplea cubos para dar una explicación pictórica del concepto.

Método 2

Problemas de suma escritos en forma desarrollada.

Before presenting addition by regrouping, review how many ones are in a group of ten, how many tens are in a group of a hundred, etc.

You can illustrate this very effectively by using money. A transparency would also be useful.

Use any of the following methods which you find helpful to explain to the students the concept of addition by regrouping and to give them practice in addition.

Method 1

A transparency may be made by the teacher which uses blocks to give a pictorial explanation of the concept.

Method 2

Addition problems in expanded form.

Ejemplo

$$\begin{array}{r}
 326 = 3 \text{ centenas} + 2 \text{ decenas} + 6 \text{ unidades} \\
 + 465 = 4 \text{ centenas} + 6 \text{ decenas} + 5 \text{ unidades} \\
 \hline
 \end{array}$$

unidad

$$\begin{array}{r}
 7 \text{ centenas} + 8 \text{ decenas} + 11 \text{ unidades} = 1 \text{ decena} + 1 \\
 \hline
 1 \text{ decena} + 1 \text{ unidad} \\
 \hline
 7 \text{ centenas} + 9 \text{ decenas} + 1 \text{ unidad}
 \end{array}$$

Example

326 = 3 hundreds + 2 tens + 6 ones

$$+ 465 = 4 \text{ hundreds} + 6 \text{ tens} + 5 \text{ ones}$$

7 hundreds + 8 tens + ~~11 ones~~ = 1 ten = 1 one

$$\begin{array}{r} 1 \text{ ten} + 1 \text{ one} \\ 7 \text{ hundreds} + 9 \text{ tens} + 1 \text{ one} \end{array}$$

Método 3

Problemas de suma escritos en
papel de cuaderno puesto hori-
zontal para formar columnas.

Method 3

Addition problems worked on notebook paper turned sideways to form columns.

Ejemplo-Example

unidades - ones

decenas - tens

centenas - hundreds

4 3 7 8 11 14

+ 3 7 11 14

8 12 16

+ 1 1 1

12 16 20

14 unidades = 1 decena + 4 unidades

14 ones = 1 ten and 4 ones

12 decenas = 1 centena + 2 decenas

12 tens = 1 hundred + 2 tens

Método 4

Frijoles y cajas (Resource No. 1)
Trabaje con problemas de suma
usando frijoles para representar
los números.

Method 4

Beans and boxes (Resource No. 1)
Work addition problems, using
beans to represent the numbers.

Ejemplo - Example

$$\begin{array}{r} 349 \\ +276 \\ \hline \end{array}$$

Represente 349, poniendo 9 frijoles en la caja rotulada unidades, 4 frijoles en la caja rotulada decenas etc. Luego represente a 276, poniendo frijoles en las cajas. después permita que los estudiantes averiguen si hay más de nueve frijoles en cualquier caja. Si los hay, tienen que sacar los frijoles y poner un frijol en la siguiente caja rotulada por el valor superior más próximo. Les saldrá la respuesta 625.

Represent 349 by placing 9 beans in the ones box, 4 beans in the tens box, etc. Then represent 276 by placing beans in the boxes. Then have the students check to see if there are more than nine beans in any of the boxes. If so, they must take out the beans, and for every ten beans, place one bean in the box with the next higher value. They will then get the answer 625.

Método 5

Problemas de suma escritos en forma compacta, mostrando los números que "se llevan."

Method 5

Addition problems written in short form, showing the numbers which are "carried."

Ejemplo - Example

$$\begin{array}{r} 486 \\ +338 \\ \hline 824 \end{array}$$

SOME HELPFUL HINTS (APPROXIMATION)

LESSON 2A-6b

Student Booklet p. 29

CONCEPT

Estimation or approximation to the nearest hundred

VOCABULARY

cifa (dígito)
estimación o aproximación
redondeo

digit
estimation or approximation
rounding

RESOURCES

None

PROCEDURE

Presente la estimación usando problemas del consumidor que traten de dinero para que los estudiantes vean un uso práctico en la enseñanza. Ejemplo: Si tienes un billete de \$10 y quieres comprar un brazalete de \$4.98 y un collar de \$3.75, ¿tendrás bastante dinero para comprar los dos? (Haga que los estudiantes redondeen los precios al dólar más próximo.)

Después que los estudiantes hayan comprendido el concepto de redondear usando dinero, use uno de los siguientes métodos para explicar el proceso de redondear los números a la centena más próxima.

Método 1

Primero, permita que los estudiantes practiquen contando de cien en cien. Después escoja un número que se debe redondear. Pregunte: ¿Entre cuáles centenas está colocado 484? 400 y 500. Luego permita que el estudiante se pregunte a sí mismo: ¿Está 484 más cerca a 400 o 500 (La centena inferior más próxima o la centena superior más próxima)? 500

Present estimation by using consumer problems involving money so that the students will see a meaningful use for it. Example: If you have a \$10 bill and you want to buy a \$4.98 bracelet and a \$3.75 necklace, will you have enough money to buy them both? (Have the students round the prices to the nearest dollar.)

After the students understand the concept of estimating with money, use one of the following methods to explain how to estimate by rounding numbers to the nearest hundred.

Method 1

First, have the students practice counting by hundreds. Next, select a number to be rounded, for example, 484. Ask: Between which hundreds is 484 located? 400 and 500. Then have the student ask himself: Is 484 nearer 400 or 500 (The hundred just lower or the hundred just higher)? 500

Método 2

Para redondear un numeral a la centena más próxima, mira la cifra que está a la derecha del lugar de las centenas. (Este lugar será el lugar de las decenas.) Si la cifra es 5 o mayor, suma uno al numeral del lugar de las centenas. Si es menor que 5, no cambies la cifra del lugar de las centenas; convierte en ceros todas las cifras que están a la derecha del lugar de las centenas.

Method 2

To round a numeral to the nearest hundred, look at the digit to the right of the hundreds place. (This will be the tens place.) If the digit is 5 or more, increase the numeral in the hundreds place by one. If it is less than 5, leave the numeral in the hundreds place unchanged, and replace all the digits which follow the hundreds place by zeros.

FINDING MISSING ADDENDS

SUBTRACTION FACTS WITH PRACTICE

SUBTRACTION PROBLEMS WITH LARGER NUMBERS

LESSONS 2A-8, 2A-9, 2A-10

Student Booklet p. 37

CONCEPTS

The use of missing addends as a preparation for subtraction

Definition of subtraction

Subtraction of whole numbers with no regrouping

The fact that the commutative and associative properties do not hold for subtraction

VOCABULARY

comprueba
forma compacta
forma desarrollada
resta o sustracción

check
short form
expanded form
subtraction

RESOURCES

1. Two pieces of twine or string, and beads which will fit onto the twine easily (Knot only one end of each piece of twine so that the beads can be slipped on or off the other end.)
2. Beans

PROCEDURE

Explique que si se sabe lo que es un sumando y una suma, un problema de suma se convierte en un problema de resta.

Ejemplo:

7 canicas + ? canicas = 9 canicas

es lo mismo que

9 canicas - 7 canicas = ? canicas

Use cualesquiera de los métodos siguientes que le puedan ayudar para explicar a los estudiantes el concepto de la resta y para hacerlos practicar la operación.

Método 1

Coloque cierto número de frijoles en un montoncito y quite algunos, mostrando cuántos quedan.

Método 2

Para números menores que o iguales a 10, emplee los dedos para demostrar problemas de resta.

Método 3

Al usar números de cuatro cifras o más haga que los estudiantes pongan horizontal una hoja de papel de cuaderno, rotulen las columnas formadas por las líneas del papel y después restan.

Explain that if one addend and the sum are known, an addition problem can be converted into a subtraction problem.

7 marbles + ? marbles = 9 marbles

is the same as

9 marbles - 7 marbles = ? marbles

Use any of the following methods which you find helpful to explain to the students the concept of subtraction and to give them practice.

Method 1

Place a certain number of beans in a pile and then remove some of them, showing how many are left.

Method 2

For numbers less than or equal to 10, use the fingers to illustrate subtraction problems.

Method 3

When the students are using numbers consisting of four or more digits, have them place their notebook paper sideways, label the columns formed by the lines of the paper, and then subtract.

Ejemplo-Example

unidades - ones	6	5	1
decenas - tens	3	1	2
centenas - hundreds	4	2	2
millares - thousands	7	4	3
	-		

Método 4

Haga que los estudiantes usen notación desarrollada para resolver problemas de suma.

Method 4

Have the students use expanded notation to work some addition problems.

Ejemplo

$$436 = 4 \text{ centenas} + 3 \text{ decenas} + 6 \text{ unidades}$$

$$\underline{-215 = 2 \text{ centenas} + 1 \text{ decena} + 5 \text{ unidades}}$$

$$2 \text{ centenas} + 2 \text{ decenas} + 1 \text{ unidad} = 221$$

Example

$$436 = 4 \text{ hundreds} + 3 \text{ tens} + 6 \text{ ones}$$

$$\underline{215 = 2 \text{ hundreds} + 1 \text{ ten} + 5 \text{ ones}}$$

$$2 \text{ hundreds} + 2 \text{ tens} + 1 \text{ one} = 221$$

Usando bolitas y dos trozos de hilo como en las lecciones 2A-3, 2A-4, demuestre que las propiedades conmutativas y asociativas no son ciertas para la sustracción. Luego demuéstrelo, empleando números.

Using beads and two pieces of twine as in Lessons 2A-3, 2A-4, show that the commutative and associative properties do not hold for subtraction. Then use numbers to illustrate this.

Ejemplo - Examples

$$\begin{array}{rcl} 8 - (4 - 1) & =? & (8 - 4) - 1 \\ 8 - 3 & =? & 4 - 1 \\ 5 & =? & 3 \\ & \underline{\text{NO}} & \end{array}$$

∴ La resta no es asociativa. ∴ Subtraction is not associative.

$$7 - 5 = ? \quad 5 - 7$$

$$2 = ? \quad ?$$

NO

∴ La resta no es conmutativa. ∴ Subtraction is not commutative.

SUBTRACTING BY REGROUPING (BORROWING)

LESSON 2A-11

Student Booklet p. 49

CONCEPT

Subtraction of whole number with regrouping (borrowing)

VOCABULARY

comprueba
reagrupación
resta (sustracción)

check
regrouping
subtraction

RESOURCES

1. Beans and three boxes, each box labeled on top with a place value centenas - hundreds, decenas - tens, unidades - ones
2. Ice cream sticks colored in three different colors to represent place values

PROCEDURE

Emplee cualesquiera de los métodos siguientes que sean útiles para explicar a los estudiantes el concepto de la resta por reagrupación y para hacerles practicar la operación de resta.

Use any of the following methods which you find helpful to explain to the students the concept of subtraction by regrouping and to give them practice in subtraction skills.

Método 1

Resuelva los problemas de resta, usando frijoles para representar los números. Coloque los frijoles en las cajas rotuladas unidades, decenas y centenas. Recuerde a los estudiantes que tienen que sacar diez frijoles de la caja de las unidades para poder colocar un frijol en la caja de las decenas, etc.

Ejemplo:
$$\begin{array}{r} 487 \\ -399 \\ \hline \end{array}$$

Empiece con cuatro frijoles en la caja de centenas, ocho frijoles en la caja de decenas y siete frijoles en la caja de unidades. Necesita sacar nueve frijoles de la caja de las unidades, pero como hay solamente siete frijoles en ella, no puede hacerlo. Entonces tiene que sacar un frijol de la caja de las unidades, entonces resulta un total de 17 frijoles. Ahora, al sacar nueve frijoles de los 17 frijoles en la caja de unidades, quedan ocho. Siga este proceso hasta que haya terminado el problema.

También puede usar palitos de helado pintados de diferentes colores en la misma manera que usó los frijoles para demostrar problemas que requieran reagrupación.

Método 2

Haga que los estudiantes resuelvan problemas de resta, usando la forma desarrollada.

Method 1

Work subtraction problems, using beans to represent the numbers. Place the beans in the boxes labeled ones, tens, and hundreds. Remind the students that ten beans from the ones box must be removed in order to place one bean in the tens box, etc.

Example:
$$\begin{array}{r} 487 \\ -399 \\ \hline \end{array}$$

Begin with four beans in the hundreds box, eight beans in the tens box, and seven beans in the ones box. You need to take away nine beans from the ones box, but you cannot do so, since there are only seven beans in it. So you have to take one bean out of the tens box and add ten to the ones box, making a total of 17 beans. Now when you take nine beans from the 17 beans in the ones box, there are eight left. Continue this process until you have completed the problem.

You can also use different colored ice cream sticks in the same way that you used the beans to illustrate subtraction problems using regrouping.

Method 2

Have the student work some subtraction problems using the expanded form.

Ejemplo a.

$$572 = 5 \text{ centenas} + 7 \text{ decenas} + 2 \text{ unidades}$$

$$\underline{247} = \underline{2 \text{ centenas} + 4 \text{ decenas} + 7 \text{ unidades}}$$

Reagrupado:

$$5 \text{ centenas} + 6 \text{ decenas} + 12 \text{ unidades}$$

$$\underline{2 \text{ centenas} + 4 \text{ decenas} + 7 \text{ unidades}}$$

$$3 \text{ centenas} + 2 \text{ decenas} + 5 \text{ unidades}$$

Example a.

$$572 = 5 \text{ hundreds} + 7 \text{ tens} + 2 \text{ ones}$$

$$- \underline{247} = \underline{2 \text{ hundreds} + 4 \text{ tens} + 7 \text{ ones}}$$

Regrouped:

$$5 \text{ hundreds} + 6 \text{ tens} + 12 \text{ ones}$$

$$\underline{2 \text{ hundreds} + 4 \text{ tens} + 7 \text{ ones}}$$

$$3 \text{ hundreds} + 2 \text{ tens} + 5 \text{ ones}$$

Ejemplo b.

$$452 = 4 \text{ centenas} + 5 \text{ decenas} + 2 \text{ unidades}$$

$$- \underline{175} = \underline{1 \text{ centena} + 7 \text{ decenas} + 5 \text{ unidades}}$$

Reagrupado:

$$4 \text{ centenas} + 4 \text{ decenas} + 12 \text{ unidades}$$

$$\underline{1 \text{ centena} + 7 \text{ decenas} + 5 \text{ unidades}}$$

$$7 \text{ unidades}$$

Reagrupado otra vez:

$$3 \text{ centenas} + 14 \text{ decenas} + 12 \text{ unidades}$$

$$\underline{1 \text{ centena} + 7 \text{ decenas} + 5 \text{ unidades}}$$

$$2 \text{ centenas} + 7 \text{ decenas} + 7 \text{ unidades} = 277$$

Example b.

$$452 = 4 \text{ hundreds} + 5 \text{ tens} + 2 \text{ ones}$$

$$- \underline{175} = \underline{1 \text{ hundred} + 7 \text{ tens} + 5 \text{ ones}}$$

Regrouped:

$$4 \text{ hundreds} + 4 \text{ tens} + 12 \text{ ones}$$

$$\underline{1 \text{ hundred} + 7 \text{ tens} + 5 \text{ ones}}$$

7 ones

Regrouped again:

$$3 \text{ hundreds} + 14 \text{ tens} + 12 \text{ ones}$$

$$\underline{1 \text{ hundred} + 7 \text{ tens} + 5 \text{ ones}}$$

$$2 \text{ hundreds} + 7 \text{ tens} + 7 \text{ ones} = 277$$

Método 3

Pida a los estudiantes que pongan horizontal una hoja de papel de cuaderno, que rotulen las columnas formadas por las líneas del papel y que después resten.

Method 3

Have the students turn their notebook paper sideways, label the columns formed by the lines of the paper, and then subtract.

Ejemplo - Example

Explique al estudiante:

Puesto que no puedes restar 8 de 3, vete a las decenas y saca 1. Ahora quedan 3 decenas.
1 decena = 10 unidades
10 unidades + 3 unidades = 13 unidades.
13 unidades - 8 unidades = 5 unidades.

Explain to the student:

You cannot take 8 from 3, so go to the tens and get 1, leaving 3 tens.
1 ten = 10 ones
10 ones + 3 ones = 13 ones
13 ones - 8 ones = 5 ones

Puesto que no puedes restar 5 de 3, vete a las centenas y saca

1. Ahora quedan 6 centenas.
 $1 \text{ centena} = 10 \text{ decenas.}$
 $10 \text{ decenas} + 3 \text{ decenas} = 13 \text{ decenas.}$
 $13 \text{ decenas} - 5 \text{ decenas} = 8 \text{ decenas.}$
 $6 \text{ centenas} - 2 \text{ centenas} = 4 \text{ centenas.}$

You cannot take 5 from 3, so go to the hundreds and get 1, leaving 6 hundreds.

$$\begin{aligned} 1 \text{ ten} &= 10 \text{ ones} \\ 10 \text{ ones} + 3 \text{ ones} &= 13 \\ 13 \text{ ones} - 8 \text{ ones} &= 5 \text{ ones} \end{aligned}$$

You cannot take 5 from 3, so go to the hundreds and get 1, leaving 6 hundreds.

$$\begin{aligned} 1 \text{ hundred} &= 10 \text{ tens} \\ 10 \text{ tens} + 3 \text{ tens} &= 13 \text{ tens.} \\ 13 \text{ tens} - 5 \text{ tens} &= 8 \text{ tens} \\ 6 \text{ hundreds} - 2 \text{ hundreds} &= 4 \text{ hundreds} \end{aligned}$$

unidades - ones	5	1	3	8	5
decenas - tens	13	1	3	5	8
centenas - hundreds	6	1	3	2	4

Método 4

Haga que los estudiantes resuelvan problemas de resta, escritos en forma compacta, mostrando la reagrupación de los números.

Method 4

Have the students work subtraction problems written in short form, showing the regrouping of the numbers.

Ejemplo - Example

$$\begin{array}{r} 3 \quad 14 \quad 1 \\ 4 \quad 5 \quad 2 \\ -1 \quad 7 \quad 5 \\ \hline 2 \quad 7 \quad 7 \end{array}$$

Método 5

Emplee este método solamente con los estudiantes que tengan gran dificultad en comprender conceptos matemáticos. Permita que estos estudiantes, al restar, usen la forma de reacción en cadena, si ningún otro método les ha ayudado a comprender la resta por reagrupación.

Method 5

Use this method only with students who have unusual difficulty in learning math concepts. Allow these students to use the chain reaction form when they subtract, if no other method has helped them to understand subtraction by regrouping.

Ejemplo - Example

$$\begin{array}{r} 2138 \\ \textcircled{1101218} \\ - 1395 \\ \hline 139 \end{array}$$

Copie el problema, saltando una línea entre el minuendo y el sustraendo. En la línea en blanco, escriba de nuevo el minuendo, mostrando la reagrupación de los números. Complete la reagrupación antes de restar. Este método elimina la necesidad de tachar las cifras del problema original.

Copy the problem, skipping a line between the minuend and subtrahend. On the line you skipped, rewrite the minuend, showing the regrouping of the numbers. Complete all the regrouping before you subtract. This method eliminates crossing out any digits of the original problem.

HOW ABOUT A ZERO?

LESSON 2A-12

Student Booklet p. 53

CONCEPT

Subtraction of whole numbers with zeros in the minuend

VOCABULARY

comprueba
reagrupación
resta (sustracción)

check
regrouping
subtraction

RESOURCES

1. Beans
2. Three boxes (each box labeled on top with a place value: centenas - hundreds, decenas - tens, unidades - ones)

PROCEDURE

Haga los problemas de suma usando frijoles para representar los números, colocando los frijoles en cajas rotuladas unidades, decenas y centenas. Emplee problemas que requieran reagrupación, escogiendo algunos que tengan 0 en la posición de las decenas en el minuendo, hasta que no se encuentren frijoles en la caja de las decenas. Cuando los estudiantes le pregunten que pueden hacer, dígalos que quiten una de las centenas para que haya frijoles en la caja de las decenas, y así puedan quitar frijoles de la caja de las decenas para colocarlos en la caja de las unidades.

Haga que los estudiantes resuelvan problemas de resta usando la forma desarrollada.

Work subtraction problems, using beans to represent the numbers, placing the beans in the boxes labeled ones, tens, and hundreds. Use problems which require regrouping (borrowing), selecting ones that have 0 in the tens place of the minuend, so that there will be no beans in the tens box from which to "borrow." When the students ask what to do, tell them to borrow 1 from the hundreds so that there will be some beans in the tens box. Then they can borrow beans from the tens box to put in the ones box.

Have the students work some subtraction problems using the expanded form.

Ejemplo

$$502 = 5 \text{ centenas} + 0 \text{ decenas} + 2 \text{ unidades}$$

$$- \underline{396} = 3 \text{ centenas} + 9 \text{ decenas} + 6 \text{ unidades}$$

Reagrupado:

$$4 \text{ centenas} + 10 \text{ decenas} + 2 \text{ unidades}$$

$$- \underline{3 \text{ centenas} + 9 \text{ decenas} + 6 \text{ unidades}}$$

Reagrupado otra vez:

$$4 \text{ centenas} + 9 \text{ decenas} + 12 \text{ unidades}$$

$$- \underline{3 \text{ centenas} + 9 \text{ decenas} + 6 \text{ unidades}}$$

$$1 \text{ centena} + 0 \text{ decenas} + 6 \text{ unidades} = 106$$

$$502 = 5 \text{ hundreds} + 0 \text{ tens} + 2 \text{ ones}$$

$$- \underline{396} = 3 \text{ hundreds} + 9 \text{ tens} + 6 \text{ ones}$$

Regrouped:

$$\begin{array}{r} 4 \text{ hundreds} + 10 \text{ tens} + 2 \text{ ones} \\ - 3 \text{ hundreds} + 9 \text{ tens} + 6 \text{ ones} \\ \hline \end{array}$$

Regrouped again:

$$\begin{array}{r} 4 \text{ hundreds} + 9 \text{ tens} + 12 \text{ ones} \\ - 3 \text{ hundreds} + 9 \text{ tens} + 6 \text{ ones} \\ \hline \end{array}$$

$$1 \text{ hundred} + 0 \text{ tens} + 6 \text{ ones} = 106$$

Pida a los estudiantes que pongan horizontal una hoja de papel cuaderno, que rotulen las líneas del papel y que después resten.

Have the students turn their papers sideways, label the columns formed by the lines of the paper, and then subtract.

Ejemplo - Example

Explique al estudiante:

No puedes restar 6 de 2.
Puesto que no hay decenas, vete a las centenas y saca 1; ahora quedan 4 centenas.

1 centena = 10 decenas,
0 decenas + 10 decenas = 10 decenas

Ahora saca 1 decena de 10 decenas; y quedan 9 decenas.

1 decena = 10 unidades
2 unidades + 10 unidades = 12 unidades

Ahora resta.

Explain to the students:

You cannot take 6 from 2. Since there are no tens, go to the hundreds and take 1, leaving 4 hundreds.

1 hundred = 10 tens
0 tens + 10 tens = 10 tens.

Now take 1 ten from 10 tens, leaving 9 tens.

1 ten = 10 ones
2 ones + 10 ones = 12 ones.

Now subtract.

unidades - ones	12	2	6
decenas - tens	9	~~10~~	9
centenas - hundreds	4	~~3~~	3

Explique a los estudiantes cómo trabajar ejemplos en los cuales el minuendo tiene más de un cero.

Show the students how to work examples in which the minuend has more than one zero.

MORE PRACTICE

LESSON 2A-13

Student Booklet p. 57

CONCEPTS

Subtraction of whole numbers (review of all types of problems)
Conversion of subtraction problems from horizontal form to vertical form

VOCABULARY

horizontal
vertical

horizontal
vertical

RESOURCES

Any of the resources already used in Level 2A

PROCEDURE

Presente un repaso breve de todos los tipos de problemas de resta. Permita que los estudiantes le pregunten lo que quieran, y explique los conceptos que todavía no comprendan.

Give a brief review of all types of subtraction problems. Let the students ask questions, and explain anything they do not yet understand.

MULTIPLICACIÓN Y DIVISIÓN DE NÚMEROS ENTEROS

OVERVIEW OF LEVEL 2B

MULTIPLICACIÓN Y DIVISIÓN DE NÚMEROS ENTEROS

OVERVIEW OF LEVEL 2B

Level 2B includes multiplication and division of whole numbers. Give all the students a timed test (5 minutes) on the multiplication facts before they begin this level. They must master these facts as a preparation for learning the concepts of Level 2B.

To introduce the level and to teach Lessons 2B-1 through 2B-4, follow Plan A for the average and above average students. For the students who have difficulty understanding mathematics and who need more time for drill on the basic multiplication facts, follow Plan B. After a student has completed the sequence of lessons provided in either plan, he will be ready for Lessons 2B-5 and 2B-6.

A useful resource for practice work in multiplication and division of whole numbers is: Box 2, "Drill and Practice Sheets for Whole Numbers, MULTIPLICATION AND DIVISION." Individualized Computational Skills Program, Houghton-Mifflin Co.

Plan A

Introduction to Plan A Basic Multiplication Facts

Lesson 2B-1

Part I: Lessons 2B-2

Part II: Lesson 2B-3

Lesson 2B-4

Plan B

Alternate Lessons Basic Multiplication Facts

Lessons 2B-1, 2B-3, and 2B-4, are covered in a five-day period.

Part I: Only Lesson 2B-2

INTRODUCTION TO PLAN A

CONCEPT

Basic multiplication facts

VOCABULARY

combinaciones básicas de la multiplicación

basic multiplication facts

RESOURCES

1. Stockpile (Multiplication game - Pattern M2-8)
2. Test on the multiplication facts (Pattern M2-9)

PROCEDURE

Repase las combinaciones básicas de la multiplicación. (Puede incluir las combinaciones de 10, de 11, y de 12.) Ayude a los estudiantes a aprender las combinaciones mediante juegos como Cartas de Reserva (Modelo M2-8) otro juego que usted elija.

Review the basic multiplication facts. (You may include the 10's, 11's, and 12's.) Give some drill work, such as Stockpile (Pattern M2-8) or a game of your choice.

Write each of the addition facts (or subtraction facts) on the front of a 3" x 5" index card, and write the answer on the back. The students can use these cards to practice the basic combinations and to quiz one another.

Have the students take a timed test on the basic multiplication facts (Pattern M2-9). The students who answer 90% of the problems correctly are ready for Lesson 2B-1. Those who make a lower score on the test should do more drill work on the multiplication facts. After they have mastered these facts, they will be ready for Lesson 2B-1.

PRODUCTS AND FACTORS

LESSON 2B-1 (PLAN A)

Student Booklet p. 3

CONCEPTS

Definition of multiplication
Definition of product
Definition of factor

Commutative Property of Multiplication
Associative Property of Multiplication
Identity Property of Multiplication
Multiplication Property of Zero

VOCABULARY

multiplicación
factor
producto
propiedad asociativa
propiedad conmutativa
propiedad del cero en la multipli-
cación
propiedad de identidad

multiplication
factor
product
associative property
commutative property
multiplication property of zero
identity property

RESOURCES

None

PROCEDURE

Explique las definiciones y las propiedades de la multiplicación de la Lección 2B-1, utilizando ejemplos numéricos para demostrarlas. Para ayudar a los estudiantes a aprender las propiedades de la multiplicación, haga que tengan en cuenta las propiedades de la adición que tienen analogía con ellas, las cuales ya han aprendido. Al continuar los estudios del Nivel 2 B, repase las propiedades de la multiplicación varias veces.

Present the definitions and the properties of multiplication which are included in Lesson 2B-1, and give numerical examples to illustrate them. To help the students learn the multiplication properties, remind them of the corresponding properties of addition, which they have already learned. As the students continue their study of Level 2B, review the multiplication properties several times.

PRODUCTS AND FACTORS

MULTPLYING WITH LARGER NUMBERS

MULTIPLYING BY ONE-DIGIT NUMBER WITH REGROUPING

LESSONS 2B-1, 2B-3, 2B-4 (PLAN B)

Student Booklet p. 3

CONCEPTS

Basic multiplication facts
Definition of multiplication
Definition of product
Definition of factor
Commutative Property of Multiplication
Associative Property of Multiplication
Identity Property of Multiplication
Multiplication Property of Zero
Multiplication by a 1-digit number

VOCABULARY

combinaciones básicas de la multiplicación
factor
producto
propiedad asociativa
propiedad conmutativa
propiedad del cero en la multiplicación
propiedad de identidad

basic multiplication facts
factor
product
associative property
commutative property
multiplication property of zero
identity property

RESOURCES

1. Flash cards (either purchases or teacher-made) with the multiplication facts written on the front and the answers written on the back. (Use 3" x 5" index cards.)
2. Stockpile (Multiplication game - Pattern M2-8)
3. Test on the multiplication facts (Pattern M2-9)
4. Five worksheets (teacher-made) to be used for drill on the basic multiplication facts (Pattern M2-10 provides a sample of Worksheet #2.)

PROCEDURE

Five days are required for this presentation.

Have the students take a time test on the basic multiplication facts (Pattern M2-9) and use the results to help determine which facts need more emphasis and drill.

The following sequence of activities is suggested for each of the five days:

1. Drill work on the multiplication facts, using games and activities. (One suggested game is "Stockpile", Pattern M2-8.)
2. Explanation of some of the concepts of the lessons in the student's booklet follows.

First Day

Definition of multiplication, product, and factor (Lesson 2B-1)

Second Day

Multiplication by a 1-digit number (Lesson 2B-3) Multiplication by a 1-digit number with regrouping (Lesson 2B-4)

Third Day

Review of Lessons 2B-3 and 2B-4

Commutative and associative properties of multiplication (Lesson 2B-1)

Fourth Day

Review of Lessons 2B-3 and 2B-4 Identity Property of Multiplication and Multiplication Property of Zero (Lesson 2B-1)

Fifth Day

Review of the four multiplication properties of Lesson 2B-1.

3. Worksheet of multiplication facts appropriate for the day.

As you distribute each worksheet, explain the rule (if there is one) that will help the students remember the set of facts presented on it.

Regla por cero: El producto del cero y cualquier número es el cero.

Rule for Zero: The product of zero and any number is 0.

Regla por uno: El producto del uno y cualquier número es el mismo número.

Rule for one: The product of one and any number is that number.

Regla por nueve: Si el multiplicador está entre 1 y 10 (incluyendo el 1 y el 10):

Rule for nine: If the multiplier is between 1 and 10 inclusive:

1. En el producto, la cifra de las decenas es uno menor que el multiplicador.
2. En el producto, la suma de la cifra de las decenas y la cifra de la unidades equivale a 9.

1. The tens digit of the product is one less than the multiplier.
2. The sum of the tens digit and the ones digit of the product is 9.

Ejemplo - Example

$$9 \times 8 = 72 \quad 7 + 2 = 9$$

$$9 \times 7 = 63 \quad 6 + 3 = 9$$

On the fifth day, give another timed test on the multiplication facts. The students who have mastered these facts are ready for Plan B.

THE DISTRIBUTIVE FACTOR

MULTIPLYING WITH LARGER NUMBERS

LESSONS 2B-2, 2B-3, (PLAN A AND PLAN B)

Student Booklet, p. 17

CONCEPTS

Distributive Property
Multiplication using one-digit multipliers

VOCABULARY

factor
multiplicación
producto
propiedad distributiva
suma
sumando

factor
multiplication
product
distributive property
sum
addend

RESOURCES

Teacher-made transparencies

PROCEDURE

For Plan A use Parts I and II. For Plan B use Part I only.

Parte I

Introduzca la propiedad distributiva explicando los dos ejemplos siguientes. Escriba los problemas en una transparencia o en la pizarra.

Permita que los estudiantes los resuelvan, escribiéndolos en una hoja de papel, mientras usted los explica.

Part I

Introduce the distributive property by discussing the following two examples. Write the problems on a transparency or on the chalkboard.

As you discuss them, have the students work them on paper.

Ejemplo 2	Example 2
Malena vendió 15 cajas de galletas en una semana. La siguiente semana, vendió 10 cajas, y a la otra semana, 5 cajas. Si vendió las galletas a \$2.00 por caja, ¿cuánto dinero obtuvo Malena?	Malena sold 15 boxes of Girl Scout cookies one week. The next week she sold 10 boxes, and the following week, 5 boxes. If she sold the cookies for \$2.00 a box, how much money did Malena collect?

Parte II

Pida a los estudiantes que utilicen la propiedad distributiva para resolver problemas sin papel o lápiz.

Part II

Ask the students to use the distributive property to work some problems without paper and pencil.

Ejemplos - Examples

$$\begin{array}{r} 8 + 2 \\ \hline (9 \times 8) + (9 \times 2) = \end{array}$$

$$\begin{array}{r} 14 + 86 \\ \hline (7 \times 14) + (7 \times 86) = \end{array}$$

Piensa 9×10
Think 9×10 90

Piensa 7×100
Think 7×100 700

Prepare una transparencia, usando problemas de este tipo, que se puedan usar como práctica de cálculo mental.

Prepare a transparency using problems of this type for practice in mental arithmetic.

Haga con sus estudiantes los ejercicios que van al final de la lección 2B-2. Pida a los estudiantes que digan las respuestas en voz alta. Luego explíqueles cómo pueden multiplicar un número de dos cifras por un número de una cifra. (Lección 2B-3).

Do the exercises at the end of Lesson 2B-2 orally with the class. Then explain how to multiply a two-digit number by a one-digit number. (Lesson 2B-3)

MULTIPLYING BY ONE-DIGIT NUMBER WITH REGROUPING

LESSON 2B-4

Student Booklet p. 25

CONCEPT

Multiplication, using a one-digit multiplier and regrouping

VOCABULARY

propiedad distributiva
reagrupación

distributive property
regrouping

RESOURCES

Problem examples given in this lesson

Ejemplo 1	Example 1
Julito vendía boletos (entradas) para el drama que iba a presentar su escuela. Vendió 5 boletos el lunes y 7 boletos el miércoles. Los boletos cuestan 50 cada uno. ¿Cuánto dinero obtuvo Julito vendiendo boletos? Pida a los estudiantes que resuelvan el problema utilizando dos métodos distintos.	Julito was selling tickets to the school play. He sold 5 tickets on Monday and 7 tickets on Wednesday. The tickets cost 50 each. How much money did John collect for the ticket sales? Ask the students to solve the problem by using two different methods.

Método 1

Suma primero y después multiplica.

$$50 \times (5 + 7) = 50 \times 12 = 600$$

Método 2

Multiplica primero y después suma.

$$\begin{aligned} 50 \times (5 + 7) &= (50 \times 5) + (50 \times 7) \\ &= 250 + 350 \\ &= 600 \end{aligned}$$

Explique a los estudiantes $(50 \times 5) + (50 \times 7) = 50 \times (5 + 7)$, porque ambas expresiones equivalen a 600. Dígales que éste es un ejemplo de la propiedad distributiva de la multiplicación con respecto a la adición.

En la pizarra, escriba la forma general de la propiedad distributiva: Para cualesquier números a , b y c :

$$a \times (b + c) = (a \times b) + (a \times c)$$

también

$$(a \times b) + (a \times c) = a \times (b + c)$$

Utilice el ejemplo 2 para demostrar que la propiedad distributiva se puede aplicar a una suma de tres (o más) números.

$$2 (15 + 10 + 5) = \dots$$

PROCEDURE

Presente el algoritmo que se usa para multiplicar un número por un multiplicador de una cifra (Lección 2B-4).

Method 1

Add first, then multiply.

Method 2

Multiply first, then add.

Explain that $(50 \times 5) + (50 \times 7) = 50 \times (5 + 7)$, since both expressions equal 600. Point out that this is an example of the distributive property of multiplication with respect to addition.

Write the general form for the distributive property on the chalkboard: For any numbers a , b , and c :

$$a \times (b + c) = (a \times b) + (a \times c)$$

and

$$(a \times b) + (a \times c) = a \times (b + c)$$

Use Example 2 to show that the distributive property can be applied to a sum of three (or more) numbers.

$$2 (15 + 10 + 5) = \dots$$

Present the algorithm which is used to multiply a number by a one-digit multiplier (Lesson 2B-4).

En la presentación, ponga énfasis en los siguientes pasos del proceso de multiplicación:

1. Ten en cuenta cuál de las cifras se escribe y cuál se lleva.

In the presentation, stress the following steps of the multiplication process:

1. Know which digit is written and which digit is carried.

Ejemplo - Example

$$\begin{array}{r} 1 \\ \cancel{4} \\ \times 3 \\ \hline 2 \end{array} \quad 4 \times 3 = 12$$

2. Primero multiplica y después suma la cifra que se lleva. Si los estudiantes suman esa cifra antes de multiplicar, van a hacer muchos errores, sobre todo en los problemas que contengan ceros.

2. Multiply first and then add the digit which is carried. Many errors occur, especially in problems which contain zeros, because students add the number which is carried before they multiply.

$$\begin{array}{r} 4 \\ 56 \\ \times 7 \\ \hline 2 \end{array}$$

Correcto - Correct:

$$(7 \times 5) + 4 = 35 + 4 = 39$$

Incorrecto - Wrong:

$$(7 + 4) \times 5 = 11 \times 5 = 55$$

Antes de presentar los problemas que contengan ceros, repase detalles tales como los siguientes:

Before introducing problems which contain zeros, review facts such as these:

$$3 \times 0 = 0$$

$$(3 \times 0) + 2 = 2$$

Ejemplos - Examples

$$\begin{array}{r} 50 \\ \times 7 \\ \hline 3514 \end{array} \quad (7 \times 0) + 1 = 1$$

$$\begin{array}{r}
 50481 \\
 \times 6 \\
 \hline
 30486
 \end{array}
 \quad
 (6 \times 0) + 4 = 4$$

MULTIPLYING BY A TWO-DIGIT NUMBER

HOW ABOUT MULTIPLYING LARGER NUMBERS?

LESSONS 2B-5, 2B-6

Student Booklet p. 31

CONCEPTS

Multiplication, using a two-digit multiplier
 Multiplication, using a three-digit multiplier

VOCABULARY

multiplicador
 productos parciales

multiplier
 partial products

RESOURCES

Worksheet on Lattice Multiplication (Pattern M2-11)

PROCEDURE

Las siguientes sugerencias serán útiles para presentar el algoritmo que se usa para multiplicar un número por un multiplicador de dos cifras o de tres cifras.

The following suggestions will be useful in presenting the algorithm which is used to multiply a number by a two-digit or a three-digit multiplier.

1. Repase el concepto de valor de posición--las decenas, las centenas y los millares.
2. Practique la multiplicación con diversos números por múltiplos de 10, de 100 y de 1,000.

1. Review place value--tens, hundreds, and thousands.
2. Practice multiplying numbers by multiples of 10, 100, and 1,000.

Ejemplos - Examples

$$3 \times 5 = 15$$

$3 \times 50 = 150$ —→ Al multiplicar por un múltiplo de 10, la última cifra será cero.
When you multiply by a multiple of 10, the last digit will be 0.

$$6 \times 7 = 42$$

$6 \times 700 = 4,200$ —→ Al multiplicar por un múltiplo de 100, las dos últimas cifras serán ceros.
When you multiply by a multiple of 100, the last two digits will be zeros.

$$9 \times 7 = 63$$

$9 \times 7,000 = 63,000$ —→ Al multiplicar por un múltiplo de 1,000 las tres últimas cifras serán ceros.
When you multiply by a multiple of 1,000, the last three digits will be zeros.

3. Practique la estimación de respuestas con los problemas de multiplicación.

3. Practice estimating answers to multiplication problems.

Ejemplo - Example

$$\begin{array}{r} 54 \\ \times 32 \\ \hline \end{array}$$

Estima:
Estimate:

$$50 \times 30 = 1500$$

$$\begin{array}{r} 76 \\ \times 22 \\ \hline \end{array}$$

Estima:
Estimate:

$$80 \times 20 = 1600$$

4. Ponga énfasis en el hecho de que, si el multiplicador es un número de dos cifras habrá dos líneas de productos parciales.

4. Emphasize that when the multiplier is a two-digit number, there will be two rows of partial products.

Ejemplo - Example

25

$\begin{array}{r} \times 35 \\ 125 \end{array}$ → línea de las unidades (25 x 5 unidades) - ones row (25 x 5 ones)

$\begin{array}{r} 750 \\ 875 \end{array}$ → línea de las decenas (25 x 3 decenas) - tens row (25 x 3 tens)

Muchas veces los estudiantes no comprenden el concepto del valor de posición. Al resolver problemas, que contienen multiplicadores de dos cifras, hacen errores al no escribir un cero en el lugar de las decenas (o por no correrlo un espacio a la izquierda).

Recuerde a los estudiantes que el producto de 25 y 3 decenas. Por lo tanto, es necesario escribir un cero (o correr los números un espacio a la izquierda). La razón de hacerlo es que, al multiplicar cualquier número por 10 o por un múltiplo de 10, se obtiene un producto que termina en cero. Los estudiantes que tengan dificultad en comprender las matemáticas deberán escribir el cero. Los demás deberán dejar un espacio en blanco. En la línea de las decenas, dos espacios en la línea de las centenas, etc.

5. Ponga énfasis en el hecho de que, al ser el multiplicador un número de tres cifras, habrá tres líneas de productos parciales.

Students often do not understand place value, and they make mistakes in working problems that have two-digit multipliers because they fail to write a zero in the tens place (or they fail to indent a space).

Remind the students that since the second row of the partial products represents the product of 25 multiplied by 3 tens, they must write a zero (or they must indent a space). The reason for doing this is that when any number is multiplied by 10 or by a multiple of 10, the product ends in zero. Students who have difficulty in math should write the zero. Other students should simply indent one space on the tens row, two spaces in the hundreds row, etc.

5. Emphasize that when the multiplier is a three-digit number, there will be three rows of partial products.

Ejemplo - Example

$$\begin{array}{r}
 382 \\
 \times 222 \\
 \hline
 764 \leftarrow \text{línea de las unidades - one row} \\
 7640 \leftarrow \text{línea de las decenas - tens row} \\
 76400 \leftarrow \text{línea de las centenas - hundreds row} \\
 \hline
 84.804
 \end{array}$$

- | | |
|--|--|
| <p>6. Haga que los estudiantes prueben sus problemas de multiplicación usando multiplicación en forma de rejilla (Hoja de trabajo M2-11)</p> | <p>6. Have the students check their multiplication problems by using lattice multiplication (Worksheet M2-11).</p> |
|--|--|

For average and above average students only:

- | | |
|--|---|
| <p>7. Una vez que los estudiantes hayan comprendido el concepto del valor de posición en problemas de multiplicación enséñeles a utilizar los siguientes métodos cortos.</p> | <p>7. After the students understand the concept of place value in multiplication, teach them to take the following shortcuts.</p> |
|--|---|

Puesto que el lugar de las decenas del multiplicador contiene un cero y puesto que $375 \times 0 = 0$. El método más fácil de resolver en el siguiente problema es el de escribir solamente dos líneas de productos parciales. Resuelva el problema de dos maneras -- el método largo y el método corto--para convencer a los estudiantes de que el producto no se cambia al añadir una línea más, compuesta de ceros.

Since the tens place of the multiplier contains a zero and since $375 \times 0 = 0$, the best way to work the following problem is to write only two rows of partial products. Work the problem both the long way and the short way to show the students that an additional row, made up of zeros, will not change the product.

Ejemplo A

Método largo

Long Method

375

x 308

3000

0000

112500
115,500

Example A

Método corto

Short Method

375

x 308

3000 ← línea de las unidades - ones row

112500 ← línea de las centenas - hundreds row
115,500

Haga que los estudiantes resuelvan el ejemplo B y el ejemplo C. No permita que escriban líneas de ceros.

Have the students work Example B and Example C. Do not let them write rows of zeros.

Ejemplo B - Example B

567

670

↓
39,690

340,200

379,890

Ejemplo C - Example C

621

700

↓ ↓
434,700

Haga que los estudiantes escriban de nuevo el Ejemplo D, usando la propiedad conmutativa. Luego pídale que calculen el producto, usando el método corto.

Have the students rewrite Example D, using the commutative property. Then have them find the product, using the short method.

Ejemplo D - Example D

600

x576

576

x600

↓ ↓
345,600

CAN YOU DIVIDE? ZERO IN DIVISION

LESSON 2B-7, 2B-8

Student Booklet p. 41

CONCEPTS

The operation of division is the inverse of multiplication.

For any non-zero number a , $0 \div a = 0$.

For any number a , $a \div 0$ is not defined.

VOCABULARY

cociente
dividendo
dividido por (entre)
división
divisor
factor
indefinido
producto

quotient
dividend
divided by
division
divisor
factor
undefined
product

RESOURCES

Flash cards for the basic multiplication facts and the division facts (commercial or teacher-made)

OPTIONAL RESOURCES

Film: ZERO: SOMETHING FOR NOTHING. Xerox, 1971, Color, 8 minutes.

PROCEDURE

Para hacer ejercicios de división rápida use "tarjetas relámpago" o juegos que usted seleccione. Señale que por cada problema de multiplicación existen dos problemas de división.

Use flash cards or games of your choice to drill the students on the division facts. Point out that every multiplication fact produces two division facts.

$$9 \times 8 = 72 \begin{cases} \rightarrow 72 \div 9 = 8 \\ \rightarrow 72 \div 8 = 9 \end{cases}$$

Al explicar la división con ceros, escriba el problema de división en las dos formas: $a \div b$, y $b \overline{)a}$. Señale a los estudiantes cuál es el dividendo y cuál es el divisor. Ponga énfasis en el hecho de que el cero no puede ser divisor.

When you discuss division involving zeros, write the division problem in both forms: $a \div b$ and $b \overline{)a}$. Show the students which number is the dividend and which number is the divisor. Stress the fact that zero can never be the divisor.

3. Dé a cada celebridad billetes de distintas denominaciones.
 Celebridad 1: Dé uno (unidades)
 Celebridad 2: Dé diez (decenas)
 Celebridad 3: Dé cien (centenas)
 Celebridad 4: Dé mil (millares)
4. El presentador le pide a la celebridad #4 seis billetes de \$1,000 y los reparte entre los cinco ganadores. Le sobrará un billete de \$1,000. El secretario escribirá en la siguiente forma:

$$\begin{array}{r} 1 \\ 5 \overline{)6} \\ -5 \\ \hline 1 \end{array}$$

(La primera vez será conveniente que el profesor sirva de secretario.)

5. El presentador acude a la celebridad #3 y cambia el billete de \$1,000, que le sobra de la operación anterior, por diez billetes de \$100 y sacará además otros 8 billetes de \$100 que son parte de las ganancias.

3. Give each guest celebrity a specific denomination of money.

Guest Celebrity 1: ones

Guest Celebrity 2: tens

Guest Celebrity 3: hundreds

Guest Celebrity 4: thousands

4. The host to Guest Celebrity #4, asks for six \$1,000 bills, and then distributes them among the five winners. He has \$1,000 left. The secretary records this on the chalkboard as follows:

\$6,875

5 ganadores
(winners)

(The teacher may wish to act as secretary the first time.)

5. The host goes to Guest Celebrity #3: he exchanges the one \$1,000 bill left from Step 4 for ten \$100 bills and also obtains the eight \$100 bills that are part of the winnings.

El presentador distribuirá los 18 billetes de \$100 entre los cinco ganadores. Después de dar tres a cada uno le sobrarán tres. El secretario escribirá en la pizarra esta operación al lado de la anterior, de esta forma:

$$\begin{array}{r} 13 \\ 5 \overline{) 68} \\ \underline{-5} \\ 18 \\ \underline{-15} \\ 3 \end{array}$$

The host distributes the eighteen \$100 bills among the five winners. After giving three to each one, he has three left.

The secretary writes this transaction beside the problem already on the board.

6. El presentador pedirá a la celebridad #2 que le cambie los tres billetes de \$100 por treinta de \$10; además sacará los siete billetes de \$10 que son parte de los \$6,875. Repartirá entonces los 37 billetes de \$10 entre los cinco ganadores. Después de darles siete a cada uno le sobrarán dos. El secretario escribirá esta operación junto a la parte del problema que ya está en la pizarra.

6. The host goes to Guest Celebrity #2 and exchanges the three hundreds for 30 tens; he also draws out the seven tens that were part of \$6,875. The host then divides the 37 tens among the five winners. He has two tens left. The secretary records this transaction, writing it beside the problems already on the board.

$$\begin{array}{r} 137 \\ 5 \overline{) 687} \\ \underline{-5} \\ 18 \\ \underline{-15} \\ 37 \\ \underline{-35} \\ 2 \end{array}$$

7. El presentador pedirá a la celebridad #1 que le cambie los dos billetes de \$10 por veinte de \$1.00, y sacará los 5 billetes de \$1.00 que

7. The host goes to Guest Celebrity #1 and exchanges the two tens for twenty ones. He also obtains the five ones that were part of the \$6,875. The

forman parte de los \$6,875. El presentador repartirá entonces los veinticinco billetes de \$1.00 entre los 5 ganadores. Les dará cinco a cada ganador sin que le sobre ninguno. El secretario escribirá en la pizarra esta última operación junto a los que ya están allí.

host divides the 25 ones among the five winners. There is no reminder. The secretary records this final transaction beside the problems already on the board.

$$\begin{array}{r}
 1,355 \\
 5 \overline{) 6,875} \\
 \underline{-5} \\
 18 \\
 \underline{-15} \\
 37 \\
 \underline{-35} \\
 25 \\
 \underline{-25} \\
 0
 \end{array}$$

8. Cada ganador del concurso habrá recibido \$1,355. El secretario comprobará la división multiplicando \$1,355 por 5.

8. Each contest winner has received \$1,355. The secretary checks the division by multiplying \$1,355 by 5.

Una vez que haya introducido la división usando dinero (tiempo necesario: un día), dedique otro día a explicar y resolver problemas que no se refieren a dinero.

After you have introduced division using money (class time: one day), take another day to explain and work problems that do not refer to money.

DIVIDING BY A ONE-DIGIT DIVISOR

DIVIDING INTO A LARGER DIVIDEND

LESSONS 2B-9, 2B-10

Student Booklet p. 51

CONCEPT

Division by a one-digit divisor

VOCABULARY

cociente
dividendo
dividido por (enter)
división
divisor
factor
producto
resto (residuo)

quotient
dividend
divided by
division
divisor
factor
product
remainder

RESOURCES

Paper money in denominations of 1's, 10's, 100's, and 1,000's (commercial or teacher-made)

PROCEDURE

To present division by a 1-digit divisor, use the following activity, which has a TV game show as its setting.

Repase en primer lugar el valor de posición. Repase también cuántas unidades (cuántos unos) hay en 10, cuántos dieces hay en 100, cuántos cientos hay en 1,000.

First review place value. Also review how many ones are contained in 10, how many tens are in 100, and how many hundreds are in 1,000.

1. Escoja un estudiante como el presentador y cuatro como celebridades de un programa de televisión, y uno como secretario. Si todos los estudiantes toman parte en el juego, haga que los estudiantes a quienes no se les ha asignado un puesto escriban en sus cuadernos las operaciones que el secretario vaya escribiendo en la pizarra.
2. Problema: Hay que repartir una cantidad determinada de dinero entre los ganadores de un concurso de un programa de televisión. (Se pueden usar cantidades distintas para cada problema.) En este caso se van a repartir \$6,875 entre cinco ganadores del concurso.
1. Select one student as the host and four as guest celebrities of a TV show, and one as secretary. If the entire class is taking part, have the other students record on their notebook paper the work written by the secretary.
2. Problem: A specified amount of money is to be divided equally among the winners of a contest on a TV show. (The amount can vary from problem to problem.) In this example, \$6,875 is to be divided equally among 5 contest winners.

SHORT DIVISION

LESSON 2B-11

Student Booklet, p. 57

CONCEPT

Short division

VOCABULARY

cociente
resto (residuo)

quotient
remainder

RESOURCES

None

PROCEDURE

Esta lección se puede omitir para que aquellos estudiantes que tengan dificultad en matemáticas.

Para explicar el método corto de división, usando un divisor de una sola cifra, utilice los pasos que se muestran en Lección 2B-11 del folleto del estudiante. Use varios ejemplos y haga que los estudiantes resuelvan problemas en la pizarra.

This lesson may be omitted for students who are weak in mathematical skills.

Use the steps shown in Lesson 2B-11 of the student's booklet to explain short division, using a one-digit divisor. Make use of several examples, and have the students work some problems on the board.

DIVISORS BETWEEN 10 AND 100

DIVIDING WITH A LARGER DIVIDEND

LESSONS 2B-12, 2B-13

Student Booklet p. 61

CONCEPT

Division by two-digit divisors

VOCABULARY

cociente
dividendo
dividido por (entre)
divisor
resto (residuo)

quotient
dividend
divided by
divisor
remainder

RESOURCES

None

PROCEDURE

Give two lessons, one on each of two succeeding days.

Primer día

Para introducir la división con divisores de dos cifras, elija uno de los tres métodos siguientes.

Método 1

Repase cómo multiplicar diversos números por múltiplos de diez.

First day

To introduce division by two-digit divisors, select one of the following three methods.

Method 1

Review how to multiply numbers by multiples of 10.

Ejemplo - Examples

$$\underline{50} \times 6 = 300$$

$$\underline{90} \times 2 = 180$$

Después explique a los estudiantes cómo dividir diversos números por divisores que sean múltiplos de 10.

Then explain how to divide by two-digit divisors which are multiples of 10.

Ejemplos - Examples

$$\begin{array}{r} 6 \\ 40 \overline{) 240} \\ \underline{-240} \end{array} \leftarrow 6 \times 40$$

$$\begin{array}{r} 9 \text{ r } 4 \\ 30 \overline{) 274} \\ \underline{-270} \\ 4 \end{array} \leftarrow 9 \times 30$$

Método 2

Prepare una hoja de trabajo con problemas de división, usando 25 como divisor en todos los problemas. Ayude a los estudiantes a imaginarse los dividendos como cantidades de dinero y el divisor como una moneda de 25 centavos. Así podrán estimar ó calcular aproximadamente los cocientes parciales, simplemente pensando cuántas monedas de centavos vale una determinada cantidad de dinero. Puesto que la mayoría de los estudiantes tienen una idea clara del manejo del dinero, al menos en pequeñas cantidades, esto les permitirá concentrar su atención en el algoritmo de la división. Una vez que los estudiantes hayan resuelto problemas con 25 como divisor, haga que resuelvan problemas que tengan 23, 24 y 26 por divisor. También podrán estimar ó calcular aproximadamente los cocientes parciales pensando en monedas de 25 centavos.

Ejemplo - Example

$$\begin{array}{r} 25 \overline{) 7,925} \\ \underline{75} \\ 42 \end{array}$$
 ← Cuántos veinticinco hay en 75 ? Tres.

$$\begin{array}{r} -25 \\ \underline{175} \end{array}$$
 ← Cuántos veinticinco hay en 25 ? Uno.

$$175 \leftarrow$$
 Cuántos veinticinco hay en \$1.75? Siete.

Método 3

Para los estudiantes que tengan más dificultad en entender los conceptos matemáticos, prepare hojas de trabajo con 10 ó 15

Method 2

Prepare a worksheet of division problems, using 25 as the divisor of each problem. Have the students think of the dividend as an amount of money and the divisor as one quarter. They can then estimate the partial quotients by thinking how many quarters are contained in specified amounts of money. Since most students are very familiar with money, this will permit them to concentrate on learning the division algorithm. After the students have worked problems with divisors of 25, have them work problems with divisors of 23, 24, and 26. They can again estimate the partial quotients by thinking of quarters.

$$\begin{array}{r} 25 \overline{) 7,925} \\ \underline{75} \\ 42 \end{array}$$
 ← How many quarters are in 75 ? Three.

$$\begin{array}{r} 25 \\ \underline{175} \end{array}$$
 ← How many quarters are in 25 ? One.

$$175 \leftarrow$$
 How many quarters are in \$1.75? Seven.

Method 3

For the less advanced students, prepare a worksheet of 10 to 15 problems whose divisors are the same number. For example, sup-

problemas con el mismo número como divisor. Suponga, por ejemplo, que usted elige 36 como divisor. Pida a los estudiantes que escriban al principio de la página los primeros nueve múltiplos de 36. Esto les permitirá dividir con facilidad, pues pueden ver los números como referencia y así podrán concentrar su atención en el proceso de la división larga.

pose that you choose the divisor 36. At the top of the page, have the students write the first nine multiples of 36. Having these numbers readily available will allow the students to divide easily, concentrating on the process of long division.

Hoja de trabajo - Worksheet

36	36	36		36
<u>x1</u>	<u>x2</u>	<u>x3</u>		<u>x9</u>
1. 36 $\overline{) 8,431}$		2. 36 $\overline{) 5,497}$		3. 36 $\overline{) 943}$
4. 36 $\overline{) 6,872}$				15. 36 $\overline{) 9,961}$

Una vez que los estudiantes hayan aprendido a usar el algoritmo de la división, enséñeles a calcular aproximadamente los cocientes parciales redondeando el divisor a la decena más próxima.

After the students have learned how to use the division algorithm, teach them to estimate the partial quotients by rounding the divisor to the nearest ten.

Esto les permitirá dividir con facilidad, sin necesidad de escribir por adelantado los múltiplos del divisor.

This will enable them to divide easily without first writing the multiples of the divisor.

Segundo día

Second day

Explíqueles cómo dividir por divisores de dos cifras, usando el método de redondear el divisor a la decena más próxima y calcular aproximadamente los cocientes parciales. En las lecciones 2B-12 y 2B-13 del folleto del estudiante hay explicación y ejemplos.

Explain how to divide by two-digit divisors, using the method of rounding the divisor to the nearest ten and estimating the partial quotients. Lessons 2B-12 and 2B-13 of the student's booklet provide an explanation, together with examples.

DIVIDING BY A NUMBER BETWEEN 100 and 1,000

LESSON 2B-14

Student Booklet p. 69

CONCEPT

Division by three-digit divisors

VOCABULARY

cociente
dividendo
dividido por (entre)
divisor
resto (residuo)

quotient
dividend
divided by
divisor
remainder

RESOURCES

None

PROCEDURE

Time: 20 minutes

Primero repase cómo multiplicar por múltiplos de 100.

First, review how to multiply by multiples of 100.

Ejemplos - Examples

$$\begin{array}{r} 15 \times 200 = 3000 \\ 6 \times 500 = 3000 \end{array}$$

Después hagan problemas con divisores que sean múltiplos de 100.

Then work division problems whose divisors are multiples of 100.

$$\begin{array}{r} 5 \text{ r } 200 \\ 300 \overline{) 1700} \\ \underline{-1500} \\ 200 \end{array}$$

$$\begin{array}{r} 21 \text{ } 500 \\ 500 \overline{) 10500} \\ \underline{-10000} \\ 500 \\ \underline{-500} \\ 0 \end{array}$$

Explíqueles cómo dividir por divisores de 3 cifras usando el método de redondear el divisor a la centena más próxima. Haga que los estudiantes resuelvan varios problemas, tales como

$$324 \overline{) 1768}$$

Explain how to divide by three digit divisors, using the method of rounding the divisor to the nearest hundred. Have the student work several problems, such as

$$324 \overline{) 1768}$$

PROBLEMS USING SEVERAL OPERATIONS

LESSON 2B-15

Student Booklet p. 71

CONCEPT

Solution of stated problems which involve addition, subtraction, multiplication, and division of whole numbers.

VOCABULARY

¿cuánto? ¿cuántos?
diferencia
promedio
total

How much? How many?
difference
average
total

RESOURCES

None

Procedure

Resuelva con los estudiantes los problemas que se dan. Ayude a los estudiantes a encontrar palabras o frases claves que indiquen si los problemas son de suma, resta, multiplicación o división.

Work the stated problems with the class. Help the students look for key words or phrases which indicate that numbers are to be added, subtracted, multiplied, or divided.

FACTORES Y MÚLTIPLOS
OVERVIEW OF LEVEL 2C

FACTORES Y MÚLTIPLOS

OVERVIEW OF LEVEL 2C

Level 2C includes the concepts of factors and multiples, divisibility, and prime and composite numbers. Because of the abstract nature of the material, you will need to give the students many concrete and numerical examples to help them understand the basic terms.

You will probably find it helpful to change the order of the lessons of this booklet, teaching Lesson 2C-6 in the same presentation as Lesson 2C-3, and following the regular sequence for the rest of the lessons.

FACTORS AND PRODUCTS

FINDING ALL FACTORS OF A NUMBER

LESSONS 2C-1, 2C-2

Student Booklet p. 3

CONCEPTS

Factor

Product

Finding the set of all factors of a number

VOCABULARY

factor

producto

factor

product

RESOURCE

Counters or markers, such as beans or bottle caps

PROCEDURE

Tomando seis de los objetos que vaya a usar como fichas, muestre todas las distribuciones posibles con que se puede representar el número seis.

Using six counters, such as beans or bottle caps, demonstrate all the arrangements (or arrays) of these counters which represent the number six.

ooo ooo ooo
ooo ooo
1 x 6 2 x 3

oo o
oo o
oo o
oo o
oo o
oo o
3 x 2 6 x 1

Introduzca el término factor. Haga que los estudiantes señalen los factores en cada uno de los ejemplos numéricos anteriores. (El factor es uno de los términos de un problema de multiplicación.) Explíqueles también cómo el término factor, se aplica a la representación visual de cada una de las distribuciones posibles o formaciones de los objetos. (El factor es el número de filas o el número de objetos en cada fila.)

Usando objetos o factores pida a los estudiantes que formen todas las distribuciones posibles para 20, y que den los factores correspondientes. Analicen el hecho de que tres no es factor de 20, recurriendo a la demostración visual de que 20 no se puede poner en filas completas de tres. Use también la división para demostrar que tres no es factor de 20, ya que al dividir 20 por tres queda residuo.

Buscando todos los factores de un número

1. Usando 48 fichas permita que los estudiantes hagan todas las formaciones posibles de 48, indicando los factores correspondientes a cada formación. Si ninguno de los estudiantes sugiere

Introduce the term factor. Have the students point out each factor in the preceding numerical examples. (A factor is one of the terms in a multiplication problem.) Also show how the term factor applies to the visual representations of arrays. (A factor is the number of rows or the number of counters in each row.)

Use 20 counters and let the students form all the possible arrays for 20, giving the corresponding factors. Discuss the fact that three is not a factor of 20, using the visual proof that 20 counters cannot be arranged in three rows with the same number of counters in each row. Also use division to show that three is not a factor of 20, since when 20 is divided by three, there is a remainder.

Finding All the Factors of a Number

1. Use 48 counters and let the students form all the possible arrays for 48, naming the corresponding factors. If no one suggests a systematic approach, it is likely that the students will omit some arrays,

un método sistemático, probablemente se les olvidarán algunas posibilidades como 2×24 , 3×16 ó 4×12 . Si se les olvidan algunas posibilidades pregúnteles si hay alguna forma de verificar si se han cubierto todas las posibilidades.

Haga que enumeren los factores probando sucesivamente todas los números enteros como factores. En esta forma podrán estar seguros de no haber omitido ningún factor posible. Demuestre que, debido a la propiedad conmutativa, una vez que una pareja de factores se repita en orden inverso no será necesario continuar probando factores mayores. A partir de ahí todas las combinaciones posibles serán repetición en orden inverso de las anteriores.

possibly 2×24 , 3×16 , or 4×12 . If some are omitted, ask if there is a way to make certain that the suggested arrays for 48 are the only ones possible.

Have the students list the factors by trying as a factor each whole number in turn. By using this method, they can make certain that they have not omitted any factors. Demonstrate that, because of the commutative property, once a pair of factors is repeated, appearing in reverse order, there is no need to try larger numbers. The remaining arrays will represent the same factors as the previous arrays, but in reverse order.

Ejemplo - Example

Busca todos los factores de 48.

Find all the factors of 48.

$$4 \times 48$$

$$2 \times 24$$

$$3 \times 16$$

$$4 \times 12$$

$$6 \times 8$$

Todos estos factores ya se han enumerado anteriormente.

$$\left\{ \begin{array}{l} 8 \times 6 \\ 12 \times 4 \end{array} \right\}$$

All these factors have already been listed above.

$$\left\{ \begin{array}{l} 16 \times 3 \\ 24 \times 2 \\ 48 \times 1 \end{array} \right\}$$

Muestre a los estudiantes cómo enumerar, en orden natural, todo el conjunto de los factores de 48.

Show the students how to list, in natural order, the set of all the factors of 48.

{1, 2, 3, 4, 6, 8, 12, 16, 24, 48}

Además de las formaciones, use la división para mostrar qué números son factores de 48 y cuáles no.

Use division, as well as the arrays, to show which numbers are factors of 48 and which are not.

2. Pida a los estudiantes que busquen todos los factores de 18 usando la división en lugar del sistema de formaciones. Para ayudarles a desarrollar a usar un modo sistemático de hacerlo, insista en la necesidad de probar sucesivamente todos los números enteros como factores, e irlos aceptando o rechazando según produzcan división exacta o no. Una vez hecho eso, pídales que enumeren todos los factores de 18 en orden natural.

2. Ask the students to find all the factors of 18 by making use of division instead of arrays. To help them develop and use a systematic approach, insist that they try each whole number in turn and then accept or reject it as a factor. Then have them list all the factors of 18 in natural order.

3. Pida a los estudiantes que busquen todos los factores de 100. Elija que lo hagan en forma sistemática, usando la división para comprobar si los números son factores o no. Cuando lleguen a 10 x 10, explíqueles que puesto que un factor se ha repetido, ya no habrá factores nuevos y la lista está terminada. Pídales que enumeren todos los factores de 100 en orden natural.

3. Ask the students to find all the factors of 100. Have them use a systematic approach, making use of division to test whether or not a number is a factor. When they list 10 x 10, explain that since one factor has been repeated, there will be no new factors, and the list is complete. Have the students list all the factors of 100 in natural order.

Si cree que sus estudiantes necesitan más práctica, pídale que busquen todos los factores de 39, 45, 66 y 81.

If the students need more practice, have them find the set of all factors of 39, 45, 66, and 81.

EVEN AND ODD NUMBERS, DIVISIBILITY

LESSONS 2C-3, 2C-6

Student Booklet p. 11

CONCEPTS

Even numbers
Odd numbers
Divisibility
Tests for divisibility by 2, 3, and 5

VOCABULARY

divisible por (entre)
divisibilidad
números impares
números pares

divisible by
divisibility
odd numbers
even numbers

RESOURCES

None

PROCEDURE

Números pares y números impares

Even and Odd Numbers

Escriba en la pizarra los primeros 19 números enteros, y después comience a separarlos en dos grupos, los pares en uno y los impares en el otro.

List the first 19 whole numbers on the chalkboard, and begin separating them into two sets, the even numbers and the odd numbers.

0 2 4 6 . . .

1 3 5 7 . . .

Después pida a los estudiantes que completen las dos listas. Pregúnteles cómo pueden saber cuáles son los números pares y cuáles son los impares.

Guíelos para darse cuenta que los pares terminan en 0, 2, 4, 6 u 8, y los impares en 1, 3, 5, 7 ó 9.

Prueba de divisibilidad

Escriba en la pizarra varios números divisibles por 5, por ejemplo, 15, 40, 0, 5, 100, 35. Pregunte a los estudiantes cuál es la semejanza entre esos números. Hágales comprender que todos esos números terminan en 0 ó 5, y a continuación déles la prueba de divisibilidad por 5.

Explíqueles que las expresiones siguientes son equivalentes:

----es divisible por 5.
5 es factor de ----.
----es un múltiplo de 5.

Escriba en la pizarra varios números divisibles por 2, por ejemplo, 16, 20, 14, 8, 12, 0, 36. Pregunte a los estudiantes en qué se parecen esos números. No tendrán dificultad en observar que todos ellos son números pares. Entonces podrá darles la prueba de divisibilidad por 2.

Siga el mismo procedimiento para presentar la prueba de divisibilidad por 3, escribiendo en la pizarra varios números que sean divisibles por 3. Algunos ejemplos son: 12, 18, 24, 51, 90, 165. Haga que los estudiantes observen que la suma de las cifras de cada uno de esos

Have a student complete the list. Ask the students how they can easily identify which numbers are even and which numbers are odd.

Lead them to observe that the even numbers end in 0, 2, 4, 6, or 8, while the odd numbers end in 1, 3, 5, 7, or 9.

Divisibility Tests

Write on the chalkboard several numbers which are divisible by 5, for example, 15, 40, 0, 5, 100, 35. Ask the students what is alike about these numbers. Lead them to observe that all these numbers end in 0 or 5, and then state formally the test for divisibility by 5.

Explain that these expressions are interchangeable:

----is divisible by 5.
5 is a factor of ----.
----is a multiple of 5.

Write on the chalkboard several numbers which are divisible by 2, for example, 16, 20, 14, 8, 12, 0, 36. Ask the students what is alike about these numbers. They should easily observe that all these numbers are even numbers, and you can then state the test for divisibility by 2.

Follow the same procedure to present the test for divisibility by 3, writing on the chalkboard several numbers which are divisible by 3. A few examples are 12, 18, 24, 51, 90, 165. Lead the students to observe that the sum of the digits of each number is divisible by 3.

números es divisible por 3. Hágales aplicar esa regla, dando ejemplos de números más grandes que sean también divisibles por 3. Será un ejercicio agradable para los estudiantes al darle a usted números como los siguientes:

Have them make use of this fact to give examples of large numbers which are divisible by 3. they will enjoy giving numbers such as:

Ejemplos - Examples	
Número Number	Prueba de divisibilidad por 3 Test for divisibility by 3
111, 201 3 3	$1 + 1 + 1 + 2 + 0 + 1 = 6$
31, 263 3 3 9	$3 + 1 + 2 + 6 + 3 = 15$

PRIME AND COMPOSITE NUMBERS

FINDING PRIME NUMBERS

LESSONS 2C-4, 2C-5

Student Booklet, p. 13

CONCEPTS

Prime numbers

Composite numbers

Identification of all the prime numbers between 1 and 100

VOCABULARY

criba de Eratóstenes

número compuesto

número primo

sieve of Eratosthenes

composite number

prime number

RESOURCES

1. Transparency of a 10 x 10 grid (Pattern M2-12)
2. Transparency of a 10 x 10 grid containing the numbers from 1 to 100 (Pattern M2-13)

OPTIONAL RESOURCES

An alternate method of finding the prime numbers from 1 to 100 is provided in the L.A. Watts Method.

References: Stanley Bezuska, S.J. Contemporary Motivated Mathematics, Book 2. Chesnut Hill, Massachusetts: (Boston College Press, n. d., p. 62.)

PROCEDURE

Repase el procedimiento visual por el cual con diversas formaciones de fichas se pueden hallar los factores de un número, por ejemplo, 8, 12 o 15. Hágales ver que algunos números, tales como 5, 7 y 11, solamente tienen dos factores, solamente se pueden distribuir las fichas en dos formaciones.

Explíqueles que los números que se pueden representar solamente en dos formaciones (es decir, que tienen solamente dos factores) se llaman números primos, mientras que los que tienen más de dos factores se llaman compuestos.

Utilice la siguiente actividad para enseñar a los estudiantes a encontrar todos los primos entre 1 y 100, usando la criba de Eratóstenes.

Divida la clase en diez grupos de dos o tres estudiantes.

Déle a cada grupo una transparencia con un cuadrículado de 10 x 10, con un total de 100 cuadritos (Modelo M2-12).

Review the fact that various arrays can show the factors of a given number, for example, 8, 12, or 15. Show that since some numbers, such as 5, 7, or 11 have only two factors, they have only two arrays.

Explain that numbers which can be represented by two and only two arrays (meaning that they have only two factors are called prime, while composite numbers are those which have more factors).

Use the following activity to show the students how to find all the prime numbers between 1 and 100 using the sieve of Eratosthenes.

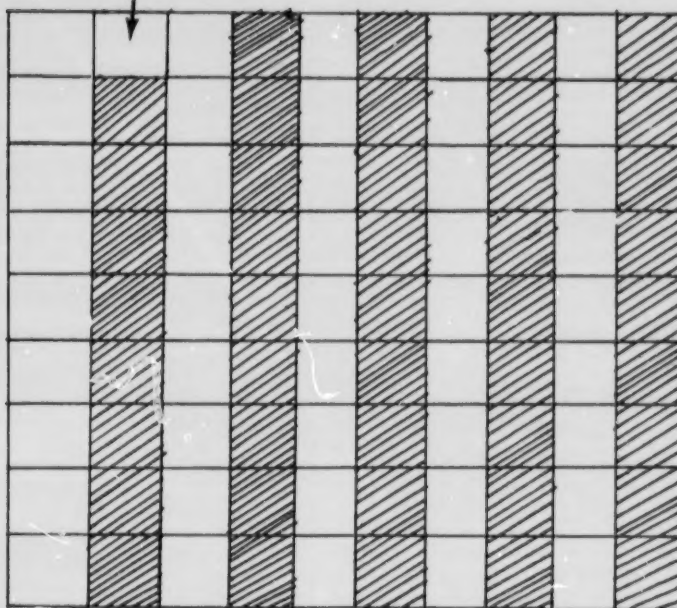
Separate the class into ten groups of two or three students each.

Given each group a transparency consisting of a 10 x 10 grid having 100 blocks. (Pattern M2-12)

El grupo que tiene el número dos comenzará a contar en el cuadro 2, y oscurecerá cada segundo cuadro a partir del 2. (El cuadro 4 será el primero que oscurecerán.)

The group with the number 2 should begin counting in box 2, shading every second box following it. (Box 4 will be the first one shaded.)

Comienza
(Start)



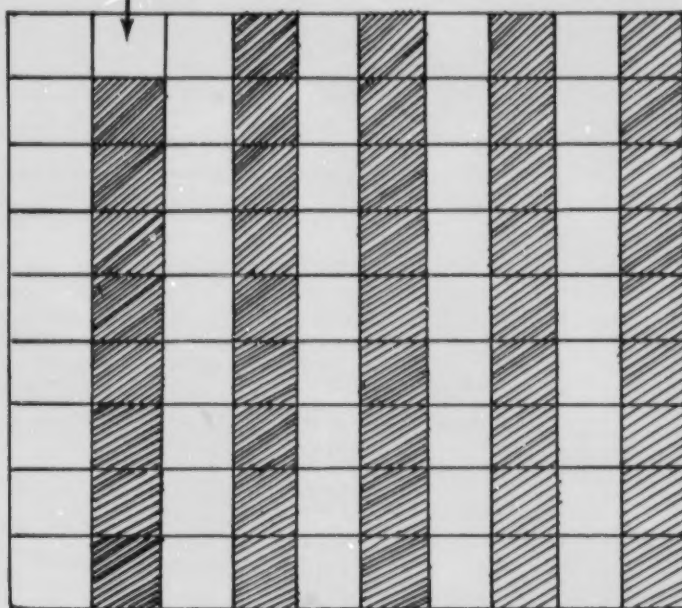
Asigne a cada grupo un número del 2 al 11.

Haga que cada grupo sombreé u oscurezca su transparencia de acuerdo con su número.

Assign each of the numbers from 2 to 11 to a different group.

Have each group shade its transparency according to its number.

Comienza
(Start)



El grupo que tiene el número 3 comenzará a contar en el 3, y oscurecerá cada tercer cuadro a partir de ahí. (El cuadro 6 será el primero que oscurecerán.)

Una vez que todos los grupos hayan completado sus transparencias úselas para cubrir una transparencia de 10 x 10 con cuadrículado del mismo tamaño y con los números del 1 al 100 escritos en los cuadros. (Model M2-13)

Primero sobreponga la transparencia del grupo 2. Este ensombrecerá todos los números que tienen 2 por factor. Sobre ésta, ponga la transparencia del grupo 3, que tiene cada tercer cuadro oscurecido. Continúe así hasta que haya sobrepuesto todas las transparencias. Todos los cuadros que tengan números compuestos habrán quedado ensombrecidos, mientras que los que tienen números primos permanecerán claros.

Note que al poner la transparencia en la que se habían oscurecido los cuadros de 11 en 11 no se elimina ningún cuadro.

Puesto que no se pueden encontrar más números compuestos, no será necesario continuar el proceso.

The group with the number 3 should begin counting with the box 3, shading every third box following it. (Box 6 will be the first one shaded.)

After all the groups have made their transparencies, use them to cover a transparency of the same 10 x 10 grid having the numbers from 1 to 100 written in the boxes. (Pattern M2-13)

First, overlay the transparency that has every second box shaded. This shades every number which has 2 as a factor. On top of this overlay the transparency that has every third box shaded. Continue in this manner until you have overlaid all the transparencies. The boxes containing composite numbers will be shaded, while those containing prime numbers will not be shaded.

Note that when you used the transparency on which every eleventh box was shaded, no new numbers were eliminated.

Since there were no new composite numbers to find, there was no need to continue the process.

EXPONENTS, USING EXPONENTS

LESSONS 2C-7, 2C-8

Student Booklet p. 27

CONCEPTS

Exponents

The use of exponents in writing numerical expressions

VOCABULARY

exponente
base
potencia

exponent
base
power

RESOURCES

None

PROCEDURE

Explique el contenido de estas lecciones utilizando la pizarra. Ponga especial atención a los estudiantes que cometen los siguientes tipos de errores:

1. Ejemplo: $2^4 = 2 \times 2 \times 2 \times 2 = 16$ Respuesta incorrecta: $2^4 = 2 \times 2 \times 2 \times 2 = 8$ (El estudiante está sumando los factores en lugar de multiplicarlos.)
2. Ejemplo: $2^3 = 2 \times 2 \times 2 \times 2 = 8$ Respuesta incorrecta: $2^3 = 2 \times 3 = 6$ (El estudiante está multiplicando la base por el exponente.)

Destaque que el exponente indica cuantas veces se usa la base como factor.

Give a chalkboard explanation of the content of these lessons. Give special attention to student who make the following types of errors:

1. Examples: $2^4 = 2 \times 2 \times 2 \times 2 = 16$ Incorrect response: $2^4 = 2 \times 2 \times 2 \times 2 = 8$
2. Example: $2^3 = 2 \times 2 \times 2 = 8$ Incorrect response: $2^3 = 2 \times 3 = 6$ (The student is multiplying the base by the exponent.)

Emphasize that the exponent simply tells how many times the base is used as a factor.

PRIME FACTORIZATION

LESSON 2C-9

Student Booklet p. 33

CONCEPTS

To give the prime factorization of a number (to factor completely)
Prime factor

VOCABULARY

descomponer un número en
factores primos
factor primo

prime factorization
prime factor

RESOURCE

Worksheet M2-14 (prime factorization of the numbers from 1 to 50)

OPTIONAL RESOURCES

Worksheet M2-15 (prime factorization of the numbers from 51 to 100)

PROCEDURE

Repase el concepto de números primos y compuestos y después introduzca la tabla (Modelo M2-14) en la cual se representan cada número primo del 1 al 50 mediante símbolos. Hágales saber que el 1 no es número primo y que por lo tanto no lo usarán como factor, ya que solamente usarán factores primos. Enseñe a los estudiantes las varias formas de representar los factores primos de algunos números usando los símbolos de la gráfica.

First, review the meaning of prime and composite numbers. Then introduce the chart (Pattern M2-14) which has a symbol representing each prime number from 1 to 50. Call to the students' attention the fact that 1 is not a prime number and that they will not use it as a factor, since they will be using only prime factors. Show the students various ways to represent the prime factors of some of the numbers, using the symbols on the chart.

$$10 = \text{D} \diamond$$

Haga que los estudiantes, trabajando independientemente, completen la gráfica usando símbolos para representar los factores. Hágales notar que el mismo grupo de símbolos se puede reagrupar en forma diferente sin que cambie el producto. Para hacérselo ver claramente use ejemplos de números tales como 24, 20, 30 y 36. Después haga que los estudiantes substituyan los números por símbolos, usando solamente números primos. Después enséñeles cómo buscar todos los factores primos de un número, ya sea:

- a. construyendo un árbol de factores
- b. mediante división

Have the students complete the chart, working independently and using only symbols to represent the factors. Point out that the same set of symbols can be arranged in a different order to give the same product. Show this by using examples, such as 24, 20, 30 and 36. Then have the students substitute numbers for symbols, using only prime numbers. Afterwards, show the students how to find all the prime factors of a number:

- a. by making a factor tree
- b. by division

COMMON FACTORS

GREATEST COMMON FACTOR

LESSONS 2C-10, 2C-11

Student Booklet p. 37

CONCEPTS

Finding the common factors of a set of numbers

Finding the greatest common factor of a set of numbers

VOCABULARY

factor común
máximo factor común (M.F.C.)

common factor
greatest common factor (G.C.F.)

RESOURCES

None

PROCEDURE

Explique los términos factor común y máximo factor común.

Luego demuéstrellos, usando un ejemplo.

Ejemplos:

Los factores de 18 son 1, 2, 3, 6, 9, y 18.

Los factores de 30 son 1, 2, 5, 6, 15 y 30.

Los factores comunes de 18 y 30 son 1, 2 y 6.

El máximo factor común de 18 y 30 es 6.

Mediante un ejemplo, muestre a los estudiantes cómo encontrar el máximo factor común de dos o más números.

Ejemplo

Para encontrar el máximo factor común de 10 y 35, búsquense los factores primos de cada uno de esos números:

$$\begin{array}{l} 10 = 2 \times 5 \\ 35 = 5 \times 7 \end{array}$$

Si se escriben los factores primos de cada número en orden natural y se hace coincidir los factores comunes escribiéndolos en columnas, será muy fácil ver cuál es el mayor. En este ejemplo el máximo factor común es 5:

$$\begin{array}{l} 10 = 2 \times \textcircled{5} \\ 35 = \textcircled{5} \times 7 \end{array}$$

Explain the terms common factor and greatest common factor.

Then give an example to illustrate them.

Examples:

The factors of 18 are 1, 2, 3, 6, 9, and 18.

The factors of 30 are 1, 2, 5, 6, 15, and 30.

The common factors of 18 and 30 are 1, 2, and 6.

The greatest common factor of 18 and 30 is 6.

Using an example, show the students how to find the greatest common factor of two or more numbers.

Example

To find the greatest common factor of 10 and 35, find the prime factors of each number:

$$\begin{array}{l} 10 = 2 \times 5 \\ 35 = 5 \times 7 \end{array}$$

By arranging the prime factors of each number in natural order and by arranging the common factors in columns as shown, it is easy to see which common factor is the greatest. In this example, the greatest common factor is 5.

$$\begin{array}{l} 10 = 2 \times \textcircled{5} \\ 35 = \textcircled{5} \times 7 \end{array}$$

Si hay más de un factor común, su producto es el máximo factor común.

If there is more than one common factor, their product is the greatest common factor.

Ejemplo - Example

$$\begin{aligned} 18 &= \boxed{2} \times \boxed{3} \times 3 \\ 30 &= \boxed{2} \times \boxed{3} \times 5 \\ \text{M.F.C. (G.C.F.)} &= 2 \times 3 = \underline{6} \end{aligned}$$

Si no existen factores primos comunes, el máximo factor común será 1.

If there are no common prime factors, the greatest common factor is 1.

Ejemplo - Example

$$\begin{aligned} 10 &= 2 \times 5 \\ 21 &= 3 \times 7 \\ \text{M.F.C. (G.C.F.)} &= 1 \end{aligned}$$

MULTIPLES, LEAST COMMON MULTIPLE

LESSONS 2C-12, 2C-13

Student Booklet p. 45

CONCEPTS

Multiples of a number

Common multiples of two or more numbers

Least common multiple of two or more numbers

VOCABULARY

mínimo común

múltiplo (M.C.M.)

múltiplo

múltiplo común

least common

multiple (L.C.M.)

multiple

common multiple

RESOURCES

None

PROCEDURE

Explique los términos múltiplo, múltiplo común y mínimo común múltiplo.

Por medio de un ejemplo, muéstrelas a los estudiantes cómo buscar el mínimo múltiplo común de dos o más números.

Primero busque los factores primos de cada uno de los números.

Explain the terms multiple, common multiple, and least common multiple.

Using an example, show the students how to find the least common multiple of two or more numbers.

First, find the prime factor of each number.

Ejemplo - Example

$$\begin{aligned} 18 &= 2 \times 3 \times 3 \\ 30 &= 2 \times 3 \times 5 \end{aligned}$$

Tome cada factor en el mayor número de veces que aparezca y multiplíquelos. En el ejemplo, 2 aparece una vez, 3 aparece dos veces y 5 aparece una vez.

Take each factor the greatest number of times it appears. In the example, 2 appears once, 3 appears twice, and 5 appears once.

Por tanto el mínimo común múltiplo de 18 y 30 será:

Therefore the least common multiple of 18 and 30 is:

$$2 \times 3 \times 3 \times 5 = 60$$

CLAVE/ANSWER KEY

**MANUAL DEL ESTUDIANTE
STUDENT BOOKLET**

NIVEL 2A/LEVEL 2A

CLAVE/ANSWER KEY

MANUAL DEL ESTUDIANTE/STUDENT BOOKLET

NIVEL 2A/LEVEL 2A

EJERCICIO 2A-1/EXERCISE 2A-1, pages 2-3

- | | | | |
|----------|------|-----------|------|
| 1. par | even | 6. impar | odd |
| 2. impar | odd | 7. par | even |
| 3. par | even | 8. par | even |
| 4. par | even | 9. impar | odd |
| 5. impar | odd | 10. impar | odd |

EJERCICIO 2A-2/EXERCISE 2A-2, pages 8-9

- | | |
|-----------------------------------|---------------------------------------|
| 1. 2, 3, 4, 5, 6, 7, 8, 9, 10 | 6. 7, 9, 8, 10, 11, 13, 12, 14, 15 |
| 2. 3, 7, 4, 11, 9, 10, 5, 8, 6 | 7. 8, 14, 11, 9, 12, 15, 10, 13, 16 |
| 3. 4, 6, 8, 10, 12, 5, 7, 9, 11 | 8. 9, 13, 17, 10, 14, 11, 15, 16, 12 |
| 4. 6, 8, 10, 12, 5, 7, 9, 11, 13 | 9. 10, 15, 11, 16, 12, 17, 13, 18, 14 |
| 5. 6, 8, 10, 12, 14, 7, 9, 11, 13 | |

EJERCICIO 2A-3/EXERCISE 2A-3, pages 14-15

1. 10, 12, 13, 14, 13, 16, 14
2. 39, 26, 55, 69, 79, 47, 99
3. 75, 58, 85, 99, 108, 88, 69
4. 57, 78, 54, 46, 49, 99, 99

EJERCICIO 2A-4/EXERCISE 2A-4, pages 16-19

1. 12, 13, 11, 10, 15, 17, 12, 15, 16
2. 19, 15, 13, 14, 13, 14, 14, 19, 18
3. 20, 18, 19, 20, 21, 23, 20, 20, 15
4. 21, 22, 21, 19, 21, 23, 22, 21, 23
5. 29, 25, 25, 28, 28, 23, 22, 27, 21
6. 24, 19, 20, 22, 22, 23, 17, 22, 20

EJERCICIO 2A-5/EXERCISE 2A-5, pages 20-23

- | | |
|--------------------|------------|
| 1. 100 | 15. 198 |
| 2. 123 | 16. 206 |
| 3. 121 | 17. 189 |
| 4. 81 | 18. 2,199 |
| 5. 76 | 19. 216 |
| 6. 561 | 20. 1,640 |
| 7. 393 | 21. 1,176 |
| 8. 1,022 | 22. 1,668 |
| 9. 1,500 | 23. 13,603 |
| 10. 1,245 | 24. 197 |
| 11. 35 | 25. 426 |
| 12. 999 | 26. 1,251 |
| 13. Juanita - Jane | 27. 2,751 |
| 14. 219 | 28. 2,858 |

EJERCICIO 2A-6a/EXERCISE 2A-6a, pages 24-27

- | | |
|--------|-----------------------------|
| 1. 26 | 7. 300 |
| 2. 27 | 8. 200 |
| 3. 28 | 9. 200 |
| 4. 24 | 10. 300 |
| 5. 26 | 11. 753 comidas/753 lunches |
| 6. 300 | 12. 420 minutos/420 minutes |

EJERCICIO 2A-6b/EXERCISE 2A-6b, pages 28-29

- | | |
|----------|---|
| 1. 1,829 | 4. 5,350 |
| 2. 1,205 | 5. ganaron 1, 788 yardas/1,788 yards gained |
| 3. 2,073 | 6. 234 conchas/234 shells |

EJERCICIO 2A-7/EXERCISE 2A-7, pages 30-35

- | | |
|-------------|-------------|
| 1. 303 | 12. 2,626 |
| 2. 213 | 13. \$319 |
| 3. 285 | 14. 441 |
| 4. 225 | 15. 306 |
| 5. 1,726 | 16. 412 |
| 6. 968 | 17. 264 |
| 7. 15,205 | 18. 1,261 |
| 8. 7,195 | 19. 212,718 |
| 9. 1,050 | 20. 91,728 |
| 10. 1,698 | 21. 225,710 |
| 11. \$7,745 | 22. 87,489 |

EJERCICIO 2A-7/EXERCISE 2A-7 (Cont.) pages 30-35

23. 194,218	27. 1,546
24. 89	28. 8,443
25. 498	29. 87,447
26. 6,424	

EJERCICIO 2A-8/EXERCISE 2A-8, pages 38-39

1. 9	9. 6
2. 10	10. 2
3. 6	11. 5
4. 6	12. 4
5. 4	13. 9
6. 2	14. 9
7. 5	15. 10
8. 9	16. 6

EJERCICIO 2A-9/EXERCISE 2A-9, pages 40-43

1. 3	11. 3
2. 3	12. 3
3. 3	13. 5
4. 2	14. 5
5. 2	15. 5
6. 6	16. 8
7. 3	17. 7
8. 1	18. 8
9. 2	19. 10
10. 4	20. 4

EJERCICIO 2A-9/EXERCISE 2A-9, (Cont.) pages 40-43

21. 9	23. 12
22. 6	24. 18

EJERCICIO 2A-10/EXERCISE 2A-10, pages 44-47

1. 21	16. 2
2. 31	17. 41
3. 40	18. 29
4. 54	19. 40
5. 64	20. 32
6. 82	21. 113
7. 25	22. 122
8. 34	23. 12
9. 34	24. 323
10. 24	25. 445
11. 12	26. 364
12. 18	27. 1,342
13. 11	28. 1,391
14. 133	29. 1,034
15. 23	

EJERCICIO 2A-11/EXERCISE 2A-11, pages 50-51

1. 26	6. 39
2. 26	7. 49
3. 19	8. 49
4. 7	9. 26
5. 15	10. 49

EJERCICIO 2A-11/EXERCISE 2A-11 (Cont.) pages 50-51

11. 19	22. 293 páginas/293 pages
12. 24	23. 389
13. 159	24. 483
14. 389	25. 299
15. 276	26. 276
16. 153	27. 279
17. 486	28. 388
18. 238	29. 917
19. 52 colecciones/52 sets	30. 918
20. 256 boletos/256 tickets	31. 789
21. 104 bicicletas de muchachos/ 104 boys' bicycles	

EJERCICIO 2A-12/EXERCISE 2A-12, pages 52-55

1. 214	12. 498
2. 313	13. 358
3. 647	14. 199
4. 516	15. 424
5. 481	16. 639
6. 659	17. 1,869
7. 220	18. 4,632
8. 424	19. 5,128
9. 49	20. 4,108
10. diferencia de 1,589/ 1,589 difference	21. 5,637
11. 2,255 millas/2,255 miles	22. 6,605

EJERCICIO 2A-13/EXERCISE 2A-13, pages 56-59

1. 9	17. 1,026
2. 9	18. 442
3. 5	19. 516
4. 29	20. 509
5. 49	21. 4,414
6. 39	22. 1,677
7. 57	23. 10,879
8. 25	24. 35,846
9. 129	25. \$10,700 más/more
10. 5	26. \$13, 913 más/more
11. 129	27. 49
12. 277	28. 39
13. 134	29. 814
14. 915	30. 480
15. 839	31. 3,642
16. 520	32. 36,027

REPASO 2A/REVIEW 2A, pages 60-63

1. 9	9. 20
2. 13	10. 22
3. 15	11. 162
4. 28	12. 796
5. 41	13. 1,013
6. 53	14. 975
7. 51	15. 9,138
8. 72	16. 12,293

REPASO 2A/REVIEW 2A (Cont.), pages 60-63

17. 187	30. 325
18. 4,994	31. 638
19. 18,440	32. 546
20. 779	33. 4,178
21. 12	34. 5,733
22. 15	35. 3,195
23. 22	36. 552
24. 25	37. 6,809
25. 24	38. 592
26. 54	39. 6,008
27. 369	40. 30,726
28. 425	41. {1,2,3,4,5, ...}
29. 150	42. {0,1,2,3,4,5, ...}

CLAVE/ANSWER KEY

**MANUAL DEL ESTUDIANTE
STUDENT BOOKLET**

NIVEL 2B/LEVEL 2B

CLAVE/ANSWER KEY
MANUAL DEL ESTUDIANTE/BOOKLET
NIVEL 2B/LEVEL 2B

EJERCICIO 2B-1/EXERCISE 2B-1, pages 10-15

1. 1	21. 9
2. 6	22. 0
3. 35	23. 4
4. 0	24. 45
5. 16	25. 3
6. 18	26. 28
7. 21	27. 16
8. 25	28. 27
9. 56	29. 24
10. 7	30. 56
11. 24	31. 10
12. 36	32. 81
13. 0	33. 6
14. 64	34. 49
15. 5	35. 15
16. 12	36. 30
17. 63	37. 20
18. 12	38. 42
19. 2	39. 8
20. 32	40. 72

EJERCICIO 2B-1/EXERCISE 2B-1 (cont.) pages 10-15

41. 18	65. 45
42. 40	66. 24
43. 4	67. 35
44. 14	68. 36
45. 48	69. 0
46. 0	70. 48
47. 36	71. 36
48. 8	72. 54
49. 54	73. 7
50. 0	74. 56
51. 20	75. 7, propiedad asociativa de la multiplicación
52. 42	7, associative property of multiplication
53. 72	76. 1, propiedad de identidad de la multiplicación
54. 18	1, identity property of multiplication
55. 18	77. 8, propiedad conmutativa de la multiplicación
56. 56	8, commutative property of multiplication
57. 42	78. 0, propiedad del cero en la multiplicación
58. 81	0, multiplication property of zero
59. 30	79. 7, propiedad de identidad de la multiplicación
60. 0	80. 6, propiedad asociativa de la multiplicación
61. 7	6, associative property of multiplication
62. 63	
63. 24	
64. 49	

EJERCICIO 2B-2/EXERCISE 2B-2, pages 18-19

- | | |
|--|-----------|
| 1. 6 | 11. 7 |
| 2. 70 | 12. 12 |
| 3. 1 | 13. 5 |
| 4. 50 | 14. 33 |
| 5. 2 | 15. 254 |
| 6. 8 | 16. 321 |
| 7. 6 | 17. 715 |
| 8. 7 | 18. 3,639 |
| 9. 2,2 | 19. 78 |
| 10. 90, 1 (Hay diversas respuestas;
se pueden aceptar dos números
cualesquiera cuya suma sea 91. | 20. 999 |

90, 1 (Answers vary; any two
numbers whose sum is 91 are
acceptable.)

EJERCICIO 2B-3/EXERCISE 2B-3, pages 22-23

- | | |
|---------|---------|
| 1. 48 | 11. 164 |
| 2. 66 | 12. 159 |
| 3. 68 | 13. 180 |
| 4. 60 | 14. 128 |
| 5. 77 | 15. 69 |
| 6. 48 | 16. 249 |
| 7. 84 | 17. 810 |
| 8. 63 | 18. 368 |
| 9. 147 | 19. 355 |
| 10. 186 | 20. 28 |

EJERCICIO 2B-3/EXERCISE 2B-3 (Cont.), pages 22-23

21. 160	24. 546
22. 124	25. 249
23. 216	

EJERCICIO 2B-4/EXERCISE 2B-4, pages 28-29

1. 161	17. 1,750
2. 272	18. 5,526
3. 225	19. 4,020
4. 455	20. 1,917
5. 432	21. 1,424
6. 539	22. 2,268
7. 133	23. 2,204
8. 371	24. 2,544
9. 420	25. 3,035
10. 640	26. 2,036
11. 320	27. 1,872
12. 228	28. 3,708
13. 625	29. 12,185
14. 1,416	30. 43,470
15. 2,268	31. 1,800 palabras/ 1,800 words
16. 1,704	32. 518 periódicos/518 papers

EJERCICIO 2B-5/EXERCISE 2B-5, pages 32-35

1. 768	4. 120
2. 882	5. 2,035
3. 968	6. 3,311

EJERCICIO 2B-5/EXERCISE 2B-5 (Cont.), pages 32-35

- | | |
|-----------|-----------------------------------|
| 7. 2,001 | 18. 3,250 |
| 8. 2,516 | 19. 10,710 |
| 9. 1,634 | 20. 45,684 |
| 10. 1,150 | 21. 46,200 |
| 11. 510 | 22. 24,541 |
| 12. 1,015 | 23. 39,705 |
| 13. 1,880 | 24. 132,426 |
| 14. 1,568 | 25. 470,776 |
| 15. 2,560 | 26. 1,377 millas/ 1,377 miles |
| 16. 2,452 | 27. 1,204 plantas/ 1,204 plants |
| 17. 2,875 | 28. 1,924 sobres/ 1,924 envelopes |
| | 29. \$77,742 |

EJERCICIO 2B-6/EXERCISE 2B-6, pages 38-39

- | | |
|-------------|--|
| 1. 20,541 | 13. 1,539,180 |
| 2. 55,125 | 14. 3,395,616 |
| 3. 451,164 | 15. 1,360,557 |
| 4. 256,360 | 16. 960,842 |
| 5. 389,205 | 17. 7,607,160 |
| 6. 109,521 | 18. 6,731,004 |
| 7. 278,006 | 19. 1,106,335 |
| 8. 219,225 | 20. 935,550 |
| 9. 240,350 | 21. 45,000 millas/45,000 miles |
| 10. 270,606 | 22. \$999,400 |
| 11. 519,225 | 23. 29,150 libras/29,150 pounds |
| 12. 899,062 | 24. 2,372,500 cuartos/2,372,500 quarts |

EJERCICIO 2B-7/EXERCISE 2B-7, pages 44-45

- | | |
|--------------|----------------------|
| 1. 14, 2, 7 | 11. 2, 1, 2 |
| 2. 32, 8, 4 | 12. 4, 1, 4 |
| 3. 35, 7, 5 | 13. 30, 6, 5 |
| 4. 27, 9, 3 | 14. 8, 4, 2 |
| 5. 40, 8, 5 | 15. 6, 8, 5, 5, 6, 3 |
| 6. 18, 3, 6 | 16. 8, 3, 7, 7, 8, 2 |
| 7. 36, 9, 4 | 17. 7, 8, 9, 9, 8, 9 |
| 8. 28, 4, 7 | 18. 9, 6, 3, 5, 1, 2 |
| 9. 45, 5, 9 | 19. 2, 2, 2, 6, 9, 7 |
| 10. 56, 8, 7 | 20. 4, 5, 6, 5, 9, 9 |

EJERCICIO 2B-8/EXERCISE 2B-8, pages 48-49

- | | |
|--------------------------|------------------------------------|
| 1. indefinido/ undefined | 6. 0 |
| 2. indefinido/ undefined | 7. indefinido; no/ undefined; no |
| 3. indefinido/ undefined | 8. 0; $7 \times \underline{0} = 0$ |
| 4. 0 | 9. indefinido/ undefined |
| 5. indefinido/ undefined | 10. 0 |

EJERCICIO 2B-9/EXERCISE 2B-9, pages 52-53

- | | |
|-----------|------------|
| 1. 13 | 7. 24 r 1 |
| 2. 12 | 8. 37 r 1 |
| 3. 22 | 9. 24 |
| 4. 19 | 10. 16 |
| 5. 12 r 3 | 11. 18 r 4 |
| 6. 32 r 1 | 12. 30 r 2 |

EJERCICIO 2B-10/EXERCISE 2B-10, pages 54-55

- | | |
|------------|-------------|
| 1. 91 | 9. 67 r 1 |
| 2. 282 | 10. 240 r 3 |
| 3. 31 | 11. 704 |
| 4. 1,061 | 12. 178 r 1 |
| 5. 51 | 13. 60 r 6 |
| 6. 731 r 5 | 14. 512 |
| 7. 61 r 5 | 15. 200 r 6 |
| 8. 212 r 3 | 16. 833 r 2 |

EJERCICIO 2B-11/EXERCISE 2B-11, pages 58-59

- | | |
|------------|-------------|
| 1. 422 r 1 | 9. 926 r 4 |
| 2. 115 r 3 | 10. 874 |
| 3. 493 r 2 | 11. 869 r 2 |
| 4. 604 | 12. 995 r 7 |
| 5. 483 r 1 | 13. 822 r 1 |
| 6. 233 r 5 | 14. 607 |
| 7. 768 r 2 | 15. 726 |
| 8. 63 r 1 | |

EJERCICIO 2B-12/EXERCISE 2B-12, pages 62-63

- | | |
|-----------|------------|
| 1. 6 | 7. 8 r 30 |
| 2. 4 r 35 | 8. 10 r 1 |
| 3. 7 | 9. 72 |
| 4. 7 r 12 | 10. 7 r 27 |
| 5. 4 r 15 | 11. 7 |
| 6. 9 | 12. 5 r 26 |

EJERCICIO 2B-12/EXERCISE 2B-12 (Cont.), pages 62-63

- | | |
|------------|-----------|
| 13. 8 r 6 | 16. 9 r 4 |
| 14. 6 r 27 | 17. 9 |
| 15. 7 | 18. 8 |

EJERCICIO 2B-13/EXERCISE 2B-13, pages 66-67

- | | |
|-------------|---|
| 1. 16 r 12 | 12. 20 r 37 |
| 2. 16 | 13. 27 r 21 |
| 3. 112 r 2 | 14. 60 |
| 4. 73 r 31 | 15. 13 r 71 |
| 5. 78 r 5 | 16. 71 r 15 |
| 6. 10 r 30 | 17. 75 libros en cada estante
75 books per shelf |
| 7. 91 | 18. 5 carreras por juego
5 runs per game |
| 8. 50 r 3 | 19. 43 galones/43 gallons |
| 9. 124 | 20. 1,500 millas/1,500 miles |
| 10. 24 r 31 | |
| 11. 37 r 9 | |

EJERCICIO 2B-14/EXERCISE 2B-14, pages 68-69

- | | |
|------------|-------------|
| 1. 6 | 6. 9 |
| 2. 6 | 7. 3 r 109 |
| 3. 7 r 126 | 8. 24 |
| 4. 4 | 9. 23 r 239 |
| 5. 4 r 153 | 10. 30 r 3 |

EJERCICIO 2B-15/EXERCISE 2B-15, pages 70-71

- | | |
|-----------|-----------|
| 1. \$2.04 | 5. 13 |
| 2. 36 | 6. 2,277 |
| 3. 29^0 | 7. 26,296 |
| 4. \$9.20 | |

REPASO 2B/REVIEW 2B, pages 72-73

- | | |
|--|---|
| 1. 54 | 12. propiedad de identidad de la multiplicación
commutative property of multiplication |
| 2. 56 | |
| 3. 161 | 13. propiedad del cero en la multiplicación
multiplication property of zero |
| 4. 4,428 | |
| 5. 64,614 | 14. 9 |
| 6. 117,992 | 15. 6 |
| 7. 467,376 | 16. 0 |
| 8. 223,122 | 17. 1 |
| 9. propiedad conmutativa de la multiplicación
commutative property of multiplication | 18. indefinido/undefined |
| | 19. 5 |
| 10. propiedad asociativa de la multiplicación
associative property of multiplication | 20. 68 r 6 |
| | 21. 9 r 2 |
| | 22. 15 |
| 11. propiedad conmutativa de la multiplicación
commutative property of multiplication | 23. 52 r 19 |
| | 24. 28 r 55 |

REPASO 2B/REVIEW 2B (Cont.), pages 72-73

25. 21

28. 27

26. 60 r 36

29. 13 r 55

27. 80 r 37

30. 99 r 107

172

CLAVE/ANSWER KEY

**MANUAL DEL ESTUDIANTE
STUDENT BOOKLET**

NIVEL 2C/LEVEL 2C

CLAVE/ANSWER KEY
MANUAL DEL ESTUDIANTE/STUDENT BOOKLET
NIVEL 2C/LEVEL 2C

EJERCICIO 2C-1/EXERCISE 2C-1, pages 2-5

- | | |
|---|---|
| 1. 6, 8; 48 | 12. no |
| 2. 9, 7; 63 | 13. sí; $6 \times 7 = 42$
yes; $6 \times 7 = 42$ |
| 3. 12, 9; 108 | 14. sí; $1 \times 21 = 21$
yes; $1 \times 21 = 21$ |
| 4. 10, 4; 40 | 15. no |
| 5. 6, 25; 150 | 16. sí; $8 \times 6 = 48$
yes; $8 \times 6 = 48$ |
| 6. 23, 9; 207 | 17. sí; $9 \times 9 = 81$
yes; $9 \times 9 = 81$ |
| 7. 20, 6; 120 | 18. no |
| 8. 11, 11; 121 | 19. sí; $10 \times 11 = 110$
yes; $10 \times 11 = 110$ |
| 9. 13, 5; 65 | 20. no |
| 10. 8, 7; 56 | |
| 11. sí; $5 \times 9 = 45$
yes; $5 \times 9 = 45$ | |

EJERCICIO 2C-2/EXERCISE 2C-2, pages 8-9

- | | |
|-----------------------------------|--|
| 1. {1, 3, 9} | 8. {1, 7} |
| 2. {1, 2, 4, 5, 10, 20} | 9. {1, 5, 25} |
| 3. {1, 3, 5, 15} | 10. {1, 2, 4, 8, 16} |
| 4. {1, 2, 4, 7, 14, 28} | 11. {1, 2, 13, 26} |
| 5. {1, 2, 5, 10} | 12. {1, 2, 3, 4, 6, 8, 12, 16, 24, 48} |
| 6. {1, 2, 3, 6, 9, 18} | 13. {1, 19} |
| 7. {1, 2, 3, 4, 6, 9, 12, 18, 36} | 14. {1, 2, 3, 5, 6, 10, 15, 30} |

EJERCICIO 2C-2/EXERCISE 2C-2 (Cont.), pages 8-9

- | | |
|------------------|---------------------------------|
| 15. {1 | 18. {1, 17} |
| 16. {1, 3, 9, 27 | 19. {1, 31} |
| 17. {2, 3, 7, 21 | 20. {1, 2, 4, 5, 8, 10, 20, 40} |

EJERCICIO 2C-3/EXERCISE 2C-3, pages 10-11

- | | |
|---------------|---------------|
| 1. par/even | 11. par/even |
| 2. par/even | 12. impar/odd |
| 3. impar/odd | 13. par/even |
| 4. impar/odd | 14. par/even |
| 5. impar/odd | 15. impar/odd |
| 6. impar/odd | 16. impar/odd |
| 7. par/even | 17. par/even |
| 8. par/even | 18. par/even |
| 9. impar/odd | 19. impar/odd |
| 10. impar/odd | 20. impar/odd |

EJERCICIO 2C-4/EXERCISE 2C-4, pages 14-15

1. 1, 2, 4, 8, número compuesto
1, 2, 4, 8, composite
2. 1, 3, número primo
1, 3, prime
3. 1, 2, 5, 10, número compuesto
1, 2, 5, 10 composite
4. 1, 3, 5, 15, número compuesto
1, 3, 5, 15, composite
5. 1, 5, 25, número compuesto
1, 5, 25, composite
6. 1, 17, número primo
1, 17, prime

EJERCICIO 2C-4/EXERCISE 2C-4 (Cont.), pages 14-15

7. 1, 5, 7, 35, número compuesto
1, 5, 7, 35, composite
8. 1, 2, 4, 5, 10, 20, número compuesto
1, 2, 4, 5, 10, 20, composite
9. 1, 23, número primo
2, 23, prime
10. 1, 29, número primo
1, 29, prime
11. 1, 2, 3, 4, 6, 12, número compuesto
1, 2, 3, 4, 6, 12, composite
12. 1, 2, 7, 14, número compuesto
1, 2, 7, 14, composite
13. 1, 2, 4, 5, 8, 10, 20, 40, número compuesto
1, 2, 4, 5, 8, 10, 20, 40, composite
14. 1, 31, número primo
1, 31, prime
15. 1, 3, 11, 33, número compuesto
1, 3, 11, 33, composite

EJERCICIO 2C-5/EXERCISE 2C-5, pages 18-19

- | | |
|-----------------------|---------------|
| 1. 2, 3, 5, 7, 11, 13 | 4. 17, 73 |
| 2. 2, 3, 5, 7 | 5. 91, 51, 28 |
| 3. 25 | |

EJERCICIO 2C-6/EXERCISE 2C-6, pages 22-23

- | | |
|-----------------|----------|
| 1. 3, 5 | 7. 3, 5 |
| 2. 3 | 8. 2, 3 |
| 3. 2, 3 | 9. 3, 5 |
| 4. 2, 3, 5 | 10. 3 |
| 5. 3 | 11. 3 |
| 6. ninguno/none | 12. 2, 3 |

EJERCICIO 2C-6/EXERCISE 2C-6, (Cont.), pages 22-23

- | | |
|------------------|-------------|
| 13. 3 | 17. 2, 3 |
| 14. 3, 5 | 18. 2, 3 |
| 15. ninguno/none | 19. 2, 3, 5 |
| 16. 2 | 20. 3 |

EJERCICIO 2C-7/EXERCISE 2C-7, pages 26-27

Base Exponente
Base Exponent

- | | |
|-------|----|
| 1. 10 | 11 |
| 2. 5 | 4 |
| 3. 23 | 18 |
| 4. 4 | 5 |
| 5. 50 | 9 |
| 6. 15 | 1 |
| 7. 19 | 6 |
| 8. 3 | 7 |
| 9. 6 | 2 |
| 10. 2 | 10 |
| 11. 7 | 3 |
| 12. 5 | 1 |

13. diez a la quinta potencia
ten to the fifth power
14. veinticinco a la tercera potencia
o veinticinco al cubo
twenty-five to the third power or
twenty-five cubed
15. tres a la primera potencia
three to the first power

16. cuatro a la novena potencia
four to the ninth power
17. siete a la segunda potencia o
siete al cuadrado
seven to the second power or
seven squared
18. ocho a la duodécima potencia
eight to the twelfth power
19. seis a la cuarta potencia
six to the fourth power
20. nueve a la sexta potencia
nine to the sixth power
21. dos a la octava potencia
two to the eighth power
22. cien a la segunda potencia o
cien al cuadrado
one hundred to the second
power or one hundred squared
23. 9^5
24. 2^1 or 2
25. 12^6
26. 8^2
27. 11^3
28. 13^4

EJERCICIO 2C-7/EXERCISE 2C-7 (Cont.), pages 26-27

29. 42^7

31. 7^2

30. 5^8

32. 10^3

EJERCICIO 2C-8/EXERCISE 2C-8, pages 30-31

1. 5^3

11. 16

2. 6^4

12. 2,401

3. 7^6

13. 36

4. $2^3 \times 3^2$

14. 400

5. $2^5 \times 3^2 \times 7^3$

15. 3,000

6. $3^2 \times 7 \times 11^4$

16. 1,024

7. $2 \times 3^2 \times 5^2 \times 7$

17. 2,352

8. $2^2 \times 5^3 \times 7 \times 11^3$

18. 196

9. $3^4 \times 5^2$

19. 825

10. $2^3 \times 3^2 \times 5^3 \times 7^4 \times 13$

20. 12,600

EJERCICIO 2C-9/EXERCISE 2C-9, pages 34-35

1. $2^3 \times 3$

11. $2^3 \times 3 \times 5$

2. $2^4 \times 3$

12. $2^2 \times 5^2$

3. $2^3 \times 3^2$

13. $3 \times 5 \times 7$

4. 2^6

14. 5^3

5. 3^4

15. $2^3 \times 11$

6. $3^2 \times 7$

16. número primo/prime

7. $2 \times 3 \times 7$

17. $3^2 \times 5^2$

8. $2 \times 3^2 \times 5$

18. $2^5 \times 5^2$

9. 3×5^2

19. 2×5^3

10. $2^3 \times 7$

20. $2^4 \times 3^2$

EJERCICIO 2C-10/EXERCISE 2C-10, pages 36-39

- | | |
|-----------------------------------|-----------------------------|
| 1. $\{1, 2, 4, 8, 16\}$ | 10. $\{1, 2, 3, 4, 6, 12\}$ |
| 2. $\{1, 2, 3, 4, 6, 8, 12, 24\}$ | 11. $\{1, 2, 4, 8\}$ |
| 3. $\{1, 2, 4, 8\}$ | 12. $\{1\}$ |
| 4. $\{1, 2, 3, 4, 6, 12\}$ | 13. $\{1, 2, 5, 10\}$ |
| 5. $\{1, 2, 4, 8, 16\}$ | 14. $\{1, 2, 4, 8\}$ |
| 6. $\{1, 2, 4, 5, 10, 20\}$ | 15. $\{1, 2, 3, 6\}$ |
| 7. $\{1, 2, 4\}$ | 16. $\{1, 7\}$ |
| 8. $\{1, 2\}$ | 17. $\{1, 2, 3, 4, 6, 12\}$ |
| 9. $\{1, 3\}$ | |

EJERCICIO 2C-11/EXERCISE 2C-11, pages 43-44

- | | |
|-------|-------|
| 1. 8 | 6. 16 |
| 2. 13 | 7. 4 |
| 3. 4 | 8. 12 |
| 4. 22 | 9. 12 |
| 5. 9 | 10. 5 |

EJERCICIO 2C-12/EXERCISE 2C-12, pages 46-47

- | | |
|----------------------------------|------------------------------------|
| 1. $\{2, 4, 6, 8, 10\}$ | 9. $\{1, 2, 4, 8, 16, 32\}$ sí/yes |
| 2. $\{9, 18, 27, 36, 45\}$ | 10. $\{9, 18, 27, \dots\}$ |
| 3. $\{15, 30, 45, 60, 75\}$ | 11. $\{12, 24, 36, \dots\}$ |
| 4. $\{7, 14, 21, 28, 35\}$ | 12. $\{12, 24, 36, \dots\}$ |
| 5. $\{100, 200, 300, 400, 500\}$ | 13. $\{20, 40, 60 \dots\}$ |
| 6. $\{48, 72, 96, 32, 112\}$ | 14. $\{20, 40, 60 \dots\}$ |
| 7. sí/yes | 15. $\{8, 16, 24 \dots\}$ |
| 8. sí/yes | |

EJERCICIO 2C-13/EXERCISE 2C-13, pages 50-51

- | | |
|--------|---------|
| 1. 48 | 6. 200 |
| 2. 120 | 7. 450 |
| 3. 30 | 8. 48 |
| 4. 80 | 9. 315 |
| 5. 144 | 10. 180 |

REPASO 2C/REVIEW 2C, pages 52-55

- | | |
|---|--|
| 1. $\{1, 2, 3, 4, 6, 8, 12, 24\}$ | 15. 5^4 |
| 2. $\{1, 2, 3, 5, 6, 10, 15, 25, 30, 50, 75, 150\}$ | 16. 10^7 |
| 3. par/even | 17. $2^3 \times 3^2 \times 5$ |
| 4. impar/odd | 18. $2^2 \times 3^3 \times 5^2 \times 7^3$ |
| 5. impar/odd | 19. 196 |
| 6. par/even | 20. 2025 |
| 7. número primo/prime | 21. 3×5^2 |
| 8. número primo/prime | 22. $2^3 \times 11$ |
| 9. número compuesto/composite | 23. $2^5 \times 5^2$ |
| 10. número compuesto/composite | 24. $2^4 \times 3^2$ |
| 11. 3, 5 | 25. 12 |
| 12. 3, 5 | 26. 12 |
| 13. número primo/prime | 27. 144 |
| 14. 2, 3, 5 | 28. 90 |

CLAVE/ANSWER KEY

MODELOS Y ACTIVIDADES
PATTERNS AND ACTIVITIES

NIVEL 2/LEVEL 2

CLAVE/ANSWER KEY

MODELOS Y ACTIVIDADES/PATTERNS AND ACTIVITIES

NIVEL 2/LEVEL 2

M2-1

COMBINACIONES BÁSICAS: LA SUMA

BASIC COMBINATIONS: ADDITION

	a.	b.	c.	d.	e.	f.	g.	h.	i.	j.
1.	3	11	8	2	10	7	9	1	11	2
2.	12	1	6	5	10	9	5	3	2	0
3.	13	8	12	10	4	6	5	13	5	7
4.	4	3	11	4	4	8	6	9	7	5
5.	8	14	5	7	12	11	3	6	15	10
6.	13	5	11	9	10	12	6	9	14	8
7.	10	7	7	9	12	8	15	7	14	8
8.	7	17	15	11	16	6	13	16	14	6
9.	10	8	10	14	15	8	18	10	9	13
10.	11	9	9	12	14	17	16	12	11	9

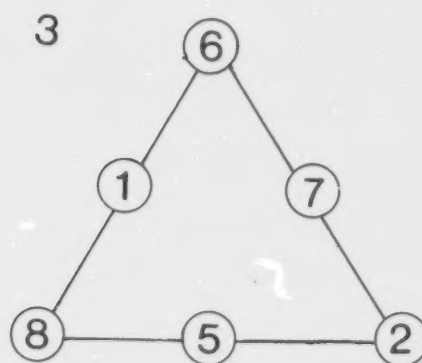
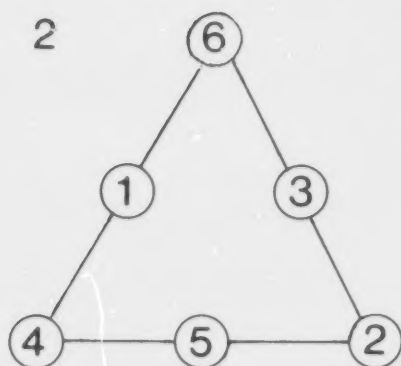
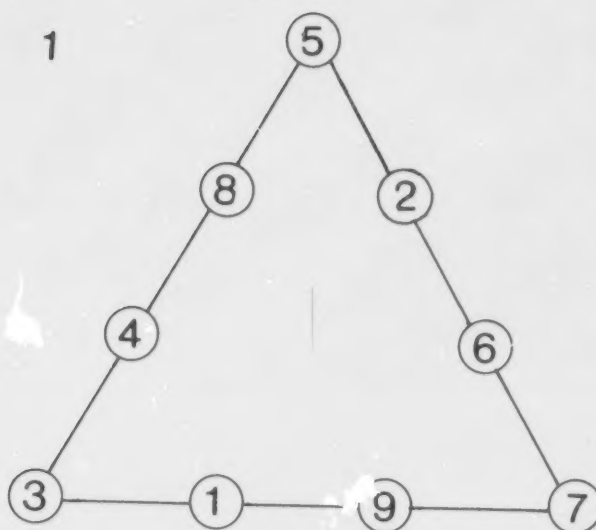
M2-2

COMBINACIONES BÁSICAS: LA RESTA

BASIC COMBINATIONS: SUBTRACTION

	a.	b.	c.	d.	e.	f.	g.	h.	i.	j.
1.	1	1	8	0	0	2	1	0	9	0
2.	0	4	1	1	0	6	7	1	3	0
3.	7	0	5	2	3	1	6	0	4	1
4.	1	4	6	3	5	2	8	0	1	9
5.	3	8	5	2	4	2	5	3	7	3
6.	8	9	4	2	9	5	3	6	3	9
7.	6	6	4	7	2	6	5	2	8	7
8.	4	6	7	4	8	3	7	5	6	3
9.	5	2	9	4	5	8	6	9	9	3
10.	9	9	4	8	2	7	7	8	5	8

M2-7

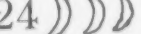
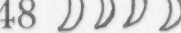


M2-9

	a.	b.	c.	d.	e.	f.	g.	h.	i.	j.
1.	5	21	40	56	30	72	27	0	28	60
2.	54	80	12	7	20	9	50	16	70	0
3.	63	18	30	70	48	42	10	8	4	40
4.	50	32	27	16	0	3	36	24	20	18
5.	90	56	36	30	10	24	8	40	54	80
6.	1	14	72	8	63	20	42	25	28	10
7.	6	4	48	81	60	40	36	21	6	8
8.	9	32	45	12	15	2	24	35	7	20
9.	16	6	18	0	12	3	10	18	14	49
10.	64	15	35	5	12	30	90	24	100	45

M2-10

	a.	b.	c.	d.	e.	f.	g.	h.	i.	j.
1.	7	0	35	9	48	56	36	40	70	49
2.	70	32	9	42	81	0	18	54	24	63
3.	49	0	35	72	16	63	5	64	14	90
4.	0	3	56	45	21	32	80	63	8	42
5.	72	27	28	0	7	0	63	4	81	56
6.	1	70	18	63	28	10	56	28	42	0
7.	24	0	49	64	35	70	56	45	90	6
8.	7	80	63	9	0	18	21	40	54	72
9.	14	48	2	56	35	16	7	21	27	14
10.	72	7	14	72	0	36	21	49	8	42

			
	 	7 	8 
9  	10  	11 	12  
13 	14  	15  	16 
17 	18   	19 	20  
21  	22  	23 	24 
25  	26  	27   	28  
29 	30   	31 	32 
33  	34  	35  	36   
37 	38  	39  	40 
41 	42   	43 	44  
45   	46  	47 	48  
49  	50   		

51  	52   	53 	54    
55  	56    	57  	58  
59 	60    	61 	62  
63   	64      	65  	66   
67 	68   	69  	70   
71 	72     	73 	74  
75   	76   	77  	78   
79 	80     	81    	82  
83 	84    	85  	86  
87  	88    	89 	90    
91  	92   	93  	94  
95  	96      	97 	98   
99   	100    		

CLAVE/ANSWER KEY

EXÁMENES/TESTS

NIVEL 2/LEVEL 2

CLAVE/ANSWER KEY

EXAMEN 1/TEST 1

NIVEL 2/LEVEL 2

- | | | | |
|-----|---------|-----|------------------------|
| 1. | 23 | 14. | 18 |
| 2. | 2,142 | 15. | 50 R 28 |
| 3. | 2,213 | 16. | 36 R 24 |
| 4. | 4,427 | 17. | $2^3 \times 7$ |
| 5. | 22 | 18. | $2^4 \times 5^2$ |
| 6. | 37 | 19. | 2 |
| 7. | 171 | 20. | 144 |
| 8. | 269 | 21. | 5 |
| 9. | 156 | 22. | 150 |
| 10. | 14,476 | 23. | 361 |
| 11. | 71,482 | 24. | 48 niños - 48 children |
| 12. | 176,528 | 25. | 50 |
| 13. | 34 | | |

CLAVE/ANSWER KEY

EXAMEN 2/TEST 2

NIVEL 2/LEVEL 2

- | | | | |
|-----|---------|-----|-----------------------------|
| 1. | 28 | 14. | 43 R 21 |
| 2. | 1,754 | 15. | 47 R 31 |
| 3. | 5,497 | 16. | 2364 R 25 |
| 4. | 2,908 | 17. | $2^2 \times 3^1 \times 7^1$ |
| 5. | 33 | 18. | $2^2 \times 3^1 \times 5^2$ |
| 6. | 29 | 19. | 12 |
| 7. | 366 | 20. | 360 |
| 8. | 361 | 21. | 5 |
| 9. | 336 | 22. | 100 |
| 10. | 59,422 | 23. | 27 |
| 11. | 155,828 | 24. | 630 |
| 12. | 263,676 | 25. | 16,515 |
| 13. | 67 | | |

MODELOS Y ACTIVIDADES
PATTERNS AND ACTIVITIES

NIVEL 2/LEVEL 2

M2 - 1

NOMBRE - NAME _____ EXAMEN CONTROLADO: 5 MINUTOS
TIMED TEST: 5 MINUTES

COMBINACIONES BÁSICAS: LA SUMA/BASIC COMBINATIONS: ADDITON

	a.	b.	c.	d.	e.	f.	g.	h.	i.	j.
1.	$\begin{array}{r} 2 \\ +1 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ +3 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ +2 \\ \hline \end{array}$	$\begin{array}{r} 0 \\ +2 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ +3 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ +2 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ +2 \\ \hline \end{array}$	$\begin{array}{r} 0 \\ +1 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ +2 \\ \hline \end{array}$	$\begin{array}{r} 1 \\ +1 \\ \hline \end{array}$
2.	$\begin{array}{r} 9 \\ +3 \\ \hline \end{array}$	$\begin{array}{r} 1 \\ +0 \\ \hline \end{array}$	$\begin{array}{r} 4 \\ +2 \\ \hline \end{array}$	$\begin{array}{r} 3 \\ +2 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ +2 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ +3 \\ \hline \end{array}$	$\begin{array}{r} 2 \\ +3 \\ \hline \end{array}$	$\begin{array}{r} 1 \\ +2 \\ \hline \end{array}$	$\begin{array}{r} 2 \\ +0 \\ \hline \end{array}$	$\begin{array}{r} 0 \\ +0 \\ \hline \end{array}$
3.	$\begin{array}{r} 7 \\ +6 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ +3 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ +4 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ +4 \\ \hline \end{array}$	$\begin{array}{r} 1 \\ +3 \\ \hline \end{array}$	$\begin{array}{r} 2 \\ +4 \\ \hline \end{array}$	$\begin{array}{r} 2 \\ +3 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ +4 \\ \hline \end{array}$	$\begin{array}{r} 4 \\ +1 \\ \hline \end{array}$	$\begin{array}{r} 3 \\ +4 \\ \hline \end{array}$
4.	$\begin{array}{r} 4 \\ +0 \\ \hline \end{array}$	$\begin{array}{r} 0 \\ +3 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ +4 \\ \hline \end{array}$	$\begin{array}{r} 0 \\ +4 \\ \hline \end{array}$	$\begin{array}{r} 3 \\ +1 \\ \hline \end{array}$	$\begin{array}{r} 4 \\ +4 \\ \hline \end{array}$	$\begin{array}{r} 3 \\ +3 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ +4 \\ \hline \end{array}$	$\begin{array}{r} 4 \\ +3 \\ \hline \end{array}$	$\begin{array}{r} 1 \\ +4 \\ \hline \end{array}$
5.	$\begin{array}{r} 3 \\ +5 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ +6 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ +0 \\ \hline \end{array}$	$\begin{array}{r} 2 \\ +5 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ +6 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ +5 \\ \hline \end{array}$	$\begin{array}{r} 3 \\ +0 \\ \hline \end{array}$	$\begin{array}{r} 1 \\ +5 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ +6 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ +5 \\ \hline \end{array}$
6.	$\begin{array}{r} 8 \\ +5 \\ \hline \end{array}$	$\begin{array}{r} 0 \\ +5 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ +6 \\ \hline \end{array}$	$\begin{array}{r} 3 \\ +6 \\ \hline \end{array}$	$\begin{array}{r} 4 \\ +6 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ +5 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ +1 \\ \hline \end{array}$	$\begin{array}{r} 4 \\ +5 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ +5 \\ \hline \end{array}$	$\begin{array}{r} 2 \\ +6 \\ \hline \end{array}$
7.	$\begin{array}{r} 3 \\ +7 \\ \hline \end{array}$	$\begin{array}{r} 1 \\ +6 \\ \hline \end{array}$	$\begin{array}{r} 0 \\ +7 \\ \hline \end{array}$	$\begin{array}{r} 2 \\ +7 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ +7 \\ \hline \end{array}$	$\begin{array}{r} 1 \\ +7 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ +8 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ +1 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ +8 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ +1 \\ \hline \end{array}$
8.	$\begin{array}{r} 7 \\ +0 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ +8 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ +7 \\ \hline \end{array}$	$\begin{array}{r} 4 \\ +7 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ +8 \\ \hline \end{array}$	$\begin{array}{r} 0 \\ +6 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ +7 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ +7 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ +7 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ +0 \\ \hline \end{array}$
9.	$\begin{array}{r} 2 \\ +8 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ +0 \\ \hline \end{array}$	$\begin{array}{r} 1 \\ +9 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ +9 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ +9 \\ \hline \end{array}$	$\begin{array}{r} 0 \\ +8 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ +9 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ +1 \\ \hline \end{array}$	$\begin{array}{r} 1 \\ +8 \\ \hline \end{array}$	$\begin{array}{r} 4 \\ +9 \\ \hline \end{array}$
10.	$\begin{array}{r} 3 \\ +8 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ +0 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ +1 \\ \hline \end{array}$	$\begin{array}{r} 4 \\ +8 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ +9 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ +9 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ +9 \\ \hline \end{array}$	$\begin{array}{r} 3 \\ +9 \\ \hline \end{array}$	$\begin{array}{r} 2 \\ +9 \\ \hline \end{array}$	$\begin{array}{r} 0 \\ +9 \\ \hline \end{array}$

M2 - 2

NOMBRE - NAME _____ EXAMEN CONTROLADO: 5 MINUTOS
 TIMED TEST: 5 MINUTES
 COMBINACIONES BÁSICAS: LA RESTA/BASIC COMBINATION: SUBTRACTION

	a.	b.	c.	d.	e.	f.	g.	h.	i.	j.
1.	$\begin{array}{r} 2 \\ -1 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ -5 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ -0 \\ \hline \end{array}$	$\begin{array}{r} 3 \\ -3 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ -9 \\ \hline \end{array}$	$\begin{array}{r} 3 \\ -1 \\ \hline \end{array}$	$\begin{array}{r} 1 \\ -0 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ -6 \\ \hline \end{array}$	$\begin{array}{r} 10 \\ -1 \\ \hline \end{array}$	$\begin{array}{r} 1 \\ -1 \\ \hline \end{array}$
2.	$\begin{array}{r} 5 \\ -5 \\ \hline \end{array}$	$\begin{array}{r} 4 \\ -0 \\ \hline \end{array}$	$\begin{array}{r} 4 \\ -3 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ -8 \\ \hline \end{array}$	$\begin{array}{r} 0 \\ -0 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ -2 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ -0 \\ \hline \end{array}$	$\begin{array}{r} 10 \\ -9 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ -2 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ -8 \\ \hline \end{array}$
3.	$\begin{array}{r} 8 \\ -1 \\ \hline \end{array}$	$\begin{array}{r} 2 \\ -2 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ -1 \\ \hline \end{array}$	$\begin{array}{r} 2 \\ -0 \\ \hline \end{array}$	$\begin{array}{r} 4 \\ -1 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ -6 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ -0 \\ \hline \end{array}$	$\begin{array}{r} 4 \\ -4 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ -1 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ -7 \\ \hline \end{array}$
4.	$\begin{array}{r} 3 \\ -2 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ -2 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ -1 \\ \hline \end{array}$	$\begin{array}{r} 3 \\ -0 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ -0 \\ \hline \end{array}$	$\begin{array}{r} 4 \\ -2 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ -1 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ -7 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ -4 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ -0 \\ \hline \end{array}$
5.	$\begin{array}{r} 12 \\ -9 \\ \hline \end{array}$	$\begin{array}{r} 10 \\ -2 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ -2 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ -4 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ -5 \\ \hline \end{array}$	$\begin{array}{r} 11 \\ -9 \\ \hline \end{array}$	$\begin{array}{r} 14 \\ -9 \\ \hline \end{array}$	$\begin{array}{r} 6 \\ -3 \\ \hline \end{array}$	$\begin{array}{r} 10 \\ -3 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ -6 \\ \hline \end{array}$
6.	$\begin{array}{r} 16 \\ -8 \\ \hline \end{array}$	$\begin{array}{r} 16 \\ -7 \\ \hline \end{array}$	$\begin{array}{r} 10 \\ -6 \\ \hline \end{array}$	$\begin{array}{r} 10 \\ -8 \\ \hline \end{array}$	$\begin{array}{r} 11 \\ -2 \\ \hline \end{array}$	$\begin{array}{r} 13 \\ -8 \\ \hline \end{array}$	$\begin{array}{r} 10 \\ -7 \\ \hline \end{array}$	$\begin{array}{r} 12 \\ -6 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ -2 \\ \hline \end{array}$	$\begin{array}{r} 18 \\ -9 \\ \hline \end{array}$
7.	$\begin{array}{r} 10 \\ -4 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ -3 \\ \hline \end{array}$	$\begin{array}{r} 12 \\ -8 \\ \hline \end{array}$	$\begin{array}{r} 14 \\ -7 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ -5 \\ \hline \end{array}$	$\begin{array}{r} 13 \\ -7 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ -4 \\ \hline \end{array}$	$\begin{array}{r} 9 \\ -7 \\ \hline \end{array}$	$\begin{array}{r} 12 \\ -4 \\ \hline \end{array}$	$\begin{array}{r} 15 \\ -8 \\ \hline \end{array}$
8.	$\begin{array}{r} 7 \\ -3 \\ \hline \end{array}$	$\begin{array}{r} 14 \\ -8 \\ \hline \end{array}$	$\begin{array}{r} 12 \\ -5 \\ \hline \end{array}$	$\begin{array}{r} 13 \\ -9 \\ \hline \end{array}$	$\begin{array}{r} 14 \\ -6 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ -5 \\ \hline \end{array}$	$\begin{array}{r} 11 \\ -4 \\ \hline \end{array}$	$\begin{array}{r} 11 \\ -6 \\ \hline \end{array}$	$\begin{array}{r} 15 \\ -9 \\ \hline \end{array}$	$\begin{array}{r} 7 \\ -4 \\ \hline \end{array}$
9.	$\begin{array}{r} 10 \\ -5 \\ \hline \end{array}$	$\begin{array}{r} 5 \\ -3 \\ \hline \end{array}$	$\begin{array}{r} 15 \\ -6 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ -4 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ -3 \\ \hline \end{array}$	$\begin{array}{r} 15 \\ -7 \\ \hline \end{array}$	$\begin{array}{r} 11 \\ -5 \\ \hline \end{array}$	$\begin{array}{r} 13 \\ -4 \\ \hline \end{array}$	$\begin{array}{r} 17 \\ -8 \\ \hline \end{array}$	$\begin{array}{r} 11 \\ -8 \\ \hline \end{array}$
10.	$\begin{array}{r} 14 \\ -5 \\ \hline \end{array}$	$\begin{array}{r} 12 \\ -3 \\ \hline \end{array}$	$\begin{array}{r} 11 \\ -7 \\ \hline \end{array}$	$\begin{array}{r} 13 \\ -5 \\ \hline \end{array}$	$\begin{array}{r} 8 \\ -6 \\ \hline \end{array}$	$\begin{array}{r} 13 \\ -6 \\ \hline \end{array}$	$\begin{array}{r} 16 \\ -9 \\ \hline \end{array}$	$\begin{array}{r} 11 \\ -3 \\ \hline \end{array}$	$\begin{array}{r} 12 \\ -7 \\ \hline \end{array}$	$\begin{array}{r} 17 \\ -9 \\ \hline \end{array}$

M2 - 3

ROMPECABEZAS DE SUMA

Instrucciones: Con las tijeras, corta cada uno de los 16 cuadrados. Pónlos juntos de tal manera que las expresiones escritas en los bordes representen el mismo número al tocarse.

ADDITION PUZZLE

Directions: Cut out each of the 16 squares. Fit them together so that the expressions written on the edges that touch, name the same number.

$3 + 4$ $6 + 2$	$3 + 2$ 5 $0 + 1$	$3 + 3$ $3 + 2$ 8	$4 + 2$ 7 $2 + 7$
7 $6 + 3$ 7	$0 + 2$ $4 + 4$ $3 + 5$	9 3 $5 + 1$	$2 + 6$ $6 + 4$ $2 + 2$ $4 + 5$
1 $6 + 1$	6 $9 + 1$ $3 + 4$	8 9 8	4 4 10 2
7 10 5	9 $1 + 4$ 6	8 6 $3 + 4$	5 $2 + 1$ $1 + 3$

M2 - 4

ROMPECABEZAS DE RESTA

Instrucciones: Con las tijeras, corta cada uno de los 16 cuadrados. Pónlos juntos de tal manera que las expresiones escritas en los bordes representen el mismo número al tocarse.

SUBTRACTION PUZZLE

Directions: Cut out each of the 16 squares. Fit them together so that the expressions written on the edges that touch, name the same number.

0 11 - 2	8 - 6 4 7 - 3	10 - 7 2 4	6 6 - 2 9 - 3 10 - 2
4 3 5	10 - 5 9 - 1 8 - 1	3 4 - 0 9 - 2	9 8 3
10 - 6 7	9 7 - 6 12 - 6	8 7 - 4 12 - 2 15 - 5	1 8 - 8 5
12 - 3 2	10 8 - 3 4	9 - 4 5	7 10 6 - 4 9 - 6

SUMAS DE FORTUNA

Materiales: Un par de dados Las reglas del juego son:

1. Pueden jugar dos o más estudiantes.
2. Cada jugador, por turno, tira los dados y suma los números que aparecen. (Los números están representados por los puntos de las caras que están arriba.)
3. Cada jugador gana dos puntos por cada respuesta correcta.
4. Los jugadores apuntan por escrito sus propios puntos y los suman al final del juego. El jugador que tenga el mayor número de puntos gana.

Variation: Several times during the school year, add a die to those the students are already using. As a result of this, the students will be rolling more than two dice and will be adding three or more numbers on each roll. This game can also be used to practice subtraction, multiplication, and division.

LUCKY SUMS

Materials: A pair of dice
The rules of the game are:

1. Two or more students can play.
2. Each player, in turn, rolls the dice, and then adds the two numbers that appear. (The numbers are represented by the dots that are on the top faces.)
3. Each player scores two points for a correct answer.
4. The players keep a record of their own scores and at the end of the game they add up their points. The player with the highest score wins.

M2 - 6

GANAS LAS CARTAS

Se puede jugar en grupos de 2 a 5 estudiantes: Usando una baraja, reparte 2 cartas y póngalas descubiertas en medio de la mesa. El primer estudiante que diga la suma gana las cartas. Si el estudiante responde incorrectamente o si todos tardan demasiado en responder, ponga las cartas otra vez en la baraja. Al final del juego, gana el estudiante que tenga el mayor número de cartas.

(El as = 11, el rey, la reina o la sota = 10 y cada otra carta = el valor numérico que aparece en la cara.)

This game can also be used to practice subtraction, multiplication, and division.

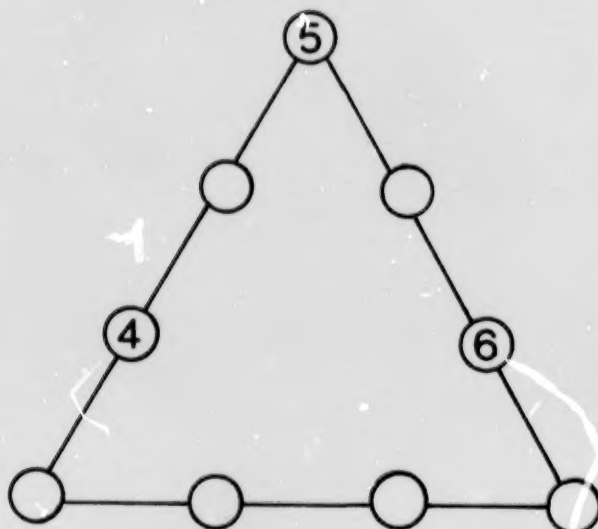
WIN THE CARDS

Groups of two to five students play at a time. Using a deck of regular playing cards, deal two cards and place them face up in the center of the table. The first student to give the sum wins the cards. If the student who answers first misses, or if the students are too slow in answering, the cards go back into the deck. The one with the most cards at the end of the game wins.

(An ace = 11, any face card = 10, and any other card = the numerical value shown.)

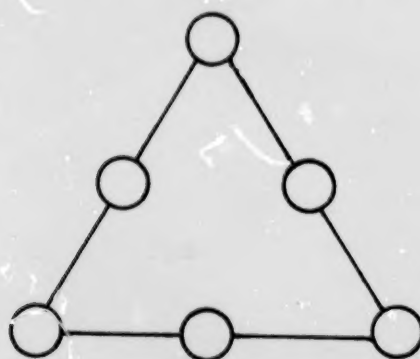
TRIÁNGULOS MÁGICOS

MAGIC TRIANGLES



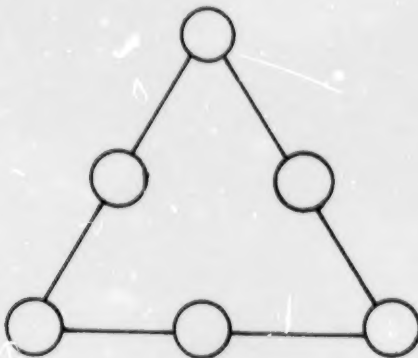
1. Copia este triángulo. Llena los círculos con los números 1, 2, 3, 7, 8, y 9 de manera que la suma de los números en cada lado sea igual a 20. Usa cada cifra solamente una vez.

1. Copy this triangle. Fill in the circles with the numbers 1, 2, 3, 7, 8, and 9 so that the sum of the numbers on each side is 20. Use each digit only once.



2. Copia este triángulo. Llena los círculos con los números 1, 2, 3, 4, 5 y 6 de manera que la suma de los números en cada lado sea igual. Usa cada cifra solamente una vez.

2. Copy this triangle. Fill in the circles with the numbers 1, 2, 3, 4, 5 and 6 so that the sums of the numbers on each side are the same. Use each digit only once.



3. Copia este triángulo. Llena los círculos con los números 1, 2, 5, 6, 7 y 8 de manera que la suma de los números en cada lado sea igual. Usa cada cifra solamente una vez.

3. Copy this triangle. Fill in the circles with the numbers 1, 2, 5, 6, 7 and 8 so that the sums of the numbers on each side are the same. Use each digit only once.

CARTAS DE RESERVA

STOCK PILE

Objective of the game: Review of the multiplication facts

Materials: Three decks of regular playing cards

The ace has a value of 1 and all cards other than face cards have their numerical value. If face cards are used, assign the jack a value of 11, the queen a value of 12, and the king a value of 13. (You may remove the face cards if you do not wish to use products of 11, 12, and 13.)

Procedimiento:

1. El profesor divide el grupo formando equipos de dos o tres personas.
2. Baraja las cartas y permita que cada equipo saque tres cartas.
3. El profesor saca dos cartas y muestra estas a todos los equipos.
4. Los estudiantes calculan el producto de los números en las dos cartas del profesor. Luego cada equipo usa dos o tres de sus cartas para tratar de obtener el mismo producto.

Ejemplo

El profesor saca 4 y 6. $4 \times 6 = 24$. Si un equipo ha sacado 2, 3 y 4, los miembros usan estas cartas para obtener 24, porque $(2 \times 3) \times 4 = 24$. O sea, si un equipo tiene las cartas 3 y 8, los miembros las usan para obtener 24, porque $3 \times 8 = 24$.

5. Cualquier equipo que haya formado el producto pone a un lado las cartas usadas para formarlo (las ponen en un montoncito y saca otras cartas para remplazarlas).

Procedure:

1. The teacher divides the group into teams of two or three persons each.
2. Then he shuffles the decks and has each team draw three cards.
3. The teacher now draws two cards and shows them to all the teams.
4. The students calculate the product of the numbers on the cards the teacher has drawn. Then each team uses two or three of its cards to try to get the same product.

Example

The teacher draws 4 and 6. $4 \times 6 = 24$. If a team has drawn 2, 3, and 4, the members use these cards to get 24, since $(2 \times 3) \times 4 = 24$. Or if a team has the cards 3 and 8, the members use these to get 24, since $3 \times 8 = 24$.

5. Any team which has formed the product puts aside the cards used in forming it (puts them in a "stockpile" and draws cards to replace them). When a play begins, each team must

Al empezar una jugada, cada equipo siempre debe de tener tres cartas.

must always have three cards to use.

6. El equipo que gana es el que tenga el montoncito más grande de cartas.

6. The team with the largest "stockpile" of cards at the end wins.

Variation: The teams may compete to see which team can form the product which is closest to the product of the numbers on the two cards the teacher has drawn. The team with the closest product places in its "stockpile" the cards they used to obtain it.

M2 - 9

NOMBRE - NAME _____

EXAMEN CONTROLADO: 5 MINUTOS
TIMED TEST: 5 MINUTES

COMBINACIONES BÁSICAS:
LA MULTIPLICACIÓN

BASIC COMBINATIONS:
MULTIPLICATION

	a.	b.	c.	d.	e.	f.	g.	h.	i.	j.
1.	$\begin{array}{r} 5 \\ \times 1 \end{array}$	$\begin{array}{r} 3 \\ \times 7 \end{array}$	$\begin{array}{r} 5 \\ \times 8 \end{array}$	$\begin{array}{r} 7 \\ \times 8 \end{array}$	$\begin{array}{r} 3 \\ \times 10 \end{array}$	$\begin{array}{r} 9 \\ \times 8 \end{array}$	$\begin{array}{r} 9 \\ \times 3 \end{array}$	$\begin{array}{r} 2 \\ \times 0 \end{array}$	$\begin{array}{r} 4 \\ \times 7 \end{array}$	$\begin{array}{r} 6 \\ \times 10 \end{array}$
2.	$\begin{array}{r} 9 \\ \times 6 \end{array}$	$\begin{array}{r} 8 \\ \times 10 \end{array}$	$\begin{array}{r} 2 \\ \times 6 \end{array}$	$\begin{array}{r} 1 \\ \times 7 \end{array}$	$\begin{array}{r} 4 \\ \times 5 \end{array}$	$\begin{array}{r} 3 \\ \times 3 \end{array}$	$\begin{array}{r} 10 \\ \times 5 \end{array}$	$\begin{array}{r} 8 \\ \times 2 \end{array}$	$\begin{array}{r} 7 \\ \times 10 \end{array}$	$\begin{array}{r} 0 \\ \times 9 \end{array}$
3.	$\begin{array}{r} 7 \\ \times 9 \end{array}$	$\begin{array}{r} 2 \\ \times 9 \end{array}$	$\begin{array}{r} 5 \\ \times 6 \end{array}$	$\begin{array}{r} 10 \\ \times 7 \end{array}$	$\begin{array}{r} 6 \\ \times 8 \end{array}$	$\begin{array}{r} 7 \\ \times 6 \end{array}$	$\begin{array}{r} 2 \\ \times 5 \end{array}$	$\begin{array}{r} 1 \\ \times 8 \end{array}$	$\begin{array}{r} 2 \\ \times 2 \end{array}$	$\begin{array}{r} 10 \\ \times 4 \end{array}$
4.	$\begin{array}{r} 5 \\ \times 10 \end{array}$	$\begin{array}{r} 4 \\ \times 8 \end{array}$	$\begin{array}{r} 3 \\ \times 9 \end{array}$	$\begin{array}{r} 2 \\ \times 8 \end{array}$	$\begin{array}{r} 0 \\ \times 4 \end{array}$	$\begin{array}{r} 1 \\ \times 3 \end{array}$	$\begin{array}{r} 4 \\ \times 9 \end{array}$	$\begin{array}{r} 3 \\ \times 8 \end{array}$	$\begin{array}{r} 2 \\ \times 10 \end{array}$	$\begin{array}{r} 3 \\ \times 6 \end{array}$
5.	$\begin{array}{r} 10 \\ \times 9 \end{array}$	$\begin{array}{r} 8 \\ \times 7 \end{array}$	$\begin{array}{r} 9 \\ \times 4 \end{array}$	$\begin{array}{r} 10 \\ \times 3 \end{array}$	$\begin{array}{r} 5 \\ \times 2 \end{array}$	$\begin{array}{r} 4 \\ \times 6 \end{array}$	$\begin{array}{r} 2 \\ \times 4 \end{array}$	$\begin{array}{r} 8 \\ \times 5 \end{array}$	$\begin{array}{r} 6 \\ \times 9 \end{array}$	$\begin{array}{r} 10 \\ \times 8 \end{array}$
6.	$\begin{array}{r} 1 \\ \times 1 \end{array}$	$\begin{array}{r} 2 \\ \times 7 \end{array}$	$\begin{array}{r} 8 \\ \times 9 \end{array}$	$\begin{array}{r} 8 \\ \times 1 \end{array}$	$\begin{array}{r} 9 \\ \times 7 \end{array}$	$\begin{array}{r} 10 \\ \times 2 \end{array}$	$\begin{array}{r} 6 \\ \times 7 \end{array}$	$\begin{array}{r} 5 \\ \times 5 \end{array}$	$\begin{array}{r} 7 \\ \times 4 \end{array}$	$\begin{array}{r} 10 \\ \times 1 \end{array}$
7.	$\begin{array}{r} 2 \\ \times 3 \end{array}$	$\begin{array}{r} 4 \\ \times 1 \end{array}$	$\begin{array}{r} 8 \\ \times 6 \end{array}$	$\begin{array}{r} 9 \\ \times 9 \end{array}$	$\begin{array}{r} 10 \\ \times 6 \end{array}$	$\begin{array}{r} 4 \\ \times 10 \end{array}$	$\begin{array}{r} 6 \\ \times 6 \end{array}$	$\begin{array}{r} 7 \\ \times 3 \end{array}$	$\begin{array}{r} 6 \\ \times 1 \end{array}$	$\begin{array}{r} 4 \\ \times 2 \end{array}$
8.	$\begin{array}{r} 9 \\ \times 1 \end{array}$	$\begin{array}{r} 8 \\ \times 4 \end{array}$	$\begin{array}{r} 9 \\ \times 5 \end{array}$	$\begin{array}{r} 3 \\ \times 4 \end{array}$	$\begin{array}{r} 5 \\ \times 3 \end{array}$	$\begin{array}{r} 2 \\ \times 1 \end{array}$	$\begin{array}{r} 6 \\ \times 4 \end{array}$	$\begin{array}{r} 7 \\ \times 5 \end{array}$	$\begin{array}{r} 7 \\ \times 1 \end{array}$	$\begin{array}{r} 5 \\ \times 4 \end{array}$
9.	$\begin{array}{r} 4 \\ \times 4 \end{array}$	$\begin{array}{r} 3 \\ \times 2 \end{array}$	$\begin{array}{r} 9 \\ \times 2 \end{array}$	$\begin{array}{r} 0 \\ \times 6 \end{array}$	$\begin{array}{r} 4 \\ \times 3 \end{array}$	$\begin{array}{r} 3 \\ \times 1 \end{array}$	$\begin{array}{r} 1 \\ \times 10 \end{array}$	$\begin{array}{r} 6 \\ \times 3 \end{array}$	$\begin{array}{r} 7 \\ \times 2 \end{array}$	$\begin{array}{r} 7 \\ \times 7 \end{array}$
10.	$\begin{array}{r} 8 \\ \times 8 \end{array}$	$\begin{array}{r} 3 \\ \times 5 \end{array}$	$\begin{array}{r} 5 \\ \times 7 \end{array}$	$\begin{array}{r} 1 \\ \times 5 \end{array}$	$\begin{array}{r} 6 \\ \times 2 \end{array}$	$\begin{array}{r} 6 \\ \times 5 \end{array}$	$\begin{array}{r} 9 \\ \times 10 \end{array}$	$\begin{array}{r} 8 \\ \times 3 \end{array}$	$\begin{array}{r} 10 \\ \times 10 \end{array}$	$\begin{array}{r} 5 \\ \times 9 \end{array}$

M2 - 10

NOMBRE - NAME _____

HOJA DE TRABAJO #2
WORKSHEET # 2

COMBINACIONES BÁSICAS LA MULTIPLICACIÓN

BASIC COMBINATIONS: MULTIPLICATION

	a.	b.	c.	d.	e.	f.	g.	h.	i.	j.
1.	$\begin{array}{r} 7 \\ \times 1 \end{array}$	$\begin{array}{r} 0 \\ \times 1 \end{array}$	$\begin{array}{r} 7 \\ \times 5 \end{array}$	$\begin{array}{r} 1 \\ \times 9 \end{array}$	$\begin{array}{r} 8 \\ \times 6 \end{array}$	$\begin{array}{r} 8 \\ \times 7 \end{array}$	$\begin{array}{r} 4 \\ \times 9 \end{array}$	$\begin{array}{r} 5 \\ \times 8 \end{array}$	$\begin{array}{r} 10 \\ \times 7 \end{array}$	$\begin{array}{r} 7 \\ \times 7 \end{array}$
2.	$\begin{array}{r} 10 \\ \times 7 \end{array}$	$\begin{array}{r} 8 \\ \times 4 \end{array}$	$\begin{array}{r} 9 \\ \times 1 \end{array}$	$\begin{array}{r} 7 \\ \times 6 \end{array}$	$\begin{array}{r} 9 \\ \times 9 \end{array}$	$\begin{array}{r} 6 \\ \times 0 \end{array}$	$\begin{array}{r} 4 \\ \times 7 \end{array}$	$\begin{array}{r} 6 \\ \times 9 \end{array}$	$\begin{array}{r} 3 \\ \times 8 \end{array}$	$\begin{array}{r} 9 \\ \times 7 \end{array}$
3.	$\begin{array}{r} 7 \\ \times 7 \end{array}$	$\begin{array}{r} 0 \\ \times 2 \end{array}$	$\begin{array}{r} 5 \\ \times 7 \end{array}$	$\begin{array}{r} 9 \\ \times 8 \end{array}$	$\begin{array}{r} 2 \\ \times 8 \end{array}$	$\begin{array}{r} 7 \\ \times 9 \end{array}$	$\begin{array}{r} 5 \\ \times 1 \end{array}$	$\begin{array}{r} 8 \\ \times 8 \end{array}$	$\begin{array}{r} 7 \\ \times 2 \end{array}$	$\begin{array}{r} 10 \\ \times 9 \end{array}$
4.	$\begin{array}{r} 0 \\ \times 10 \end{array}$	$\begin{array}{r} 1 \\ \times 3 \end{array}$	$\begin{array}{r} 7 \\ \times 8 \end{array}$	$\begin{array}{r} 9 \\ \times 5 \end{array}$	$\begin{array}{r} 3 \\ \times 7 \end{array}$	$\begin{array}{r} 4 \\ \times 8 \end{array}$	$\begin{array}{r} 10 \\ \times 8 \end{array}$	$\begin{array}{r} 9 \\ \times 7 \end{array}$	$\begin{array}{r} 8 \\ \times 1 \end{array}$	$\begin{array}{r} 6 \\ \times 7 \end{array}$
5.	$\begin{array}{r} 8 \\ \times 9 \end{array}$	$\begin{array}{r} 9 \\ \times 3 \end{array}$	$\begin{array}{r} 7 \\ \times 4 \end{array}$	$\begin{array}{r} 0 \\ \times 5 \end{array}$	$\begin{array}{r} 1 \\ \times 7 \end{array}$	$\begin{array}{r} 3 \\ \times 0 \end{array}$	$\begin{array}{r} 7 \\ \times 9 \end{array}$	$\begin{array}{r} 4 \\ \times 1 \end{array}$	$\begin{array}{r} 9 \\ \times 9 \end{array}$	$\begin{array}{r} 7 \\ \times 8 \end{array}$
6.	$\begin{array}{r} 1 \\ \times 1 \end{array}$	$\begin{array}{r} 7 \\ \times 10 \end{array}$	$\begin{array}{r} 9 \\ \times 2 \end{array}$	$\begin{array}{r} 9 \\ \times 7 \end{array}$	$\begin{array}{r} 7 \\ \times 4 \end{array}$	$\begin{array}{r} 10 \\ \times 1 \end{array}$	$\begin{array}{r} 8 \\ \times 7 \end{array}$	$\begin{array}{r} 4 \\ \times 7 \end{array}$	$\begin{array}{r} 6 \\ \times 7 \end{array}$	$\begin{array}{r} 8 \\ \times 0 \end{array}$
7.	$\begin{array}{r} 8 \\ \times 3 \end{array}$	$\begin{array}{r} 9 \\ \times 0 \end{array}$	$\begin{array}{r} 7 \\ \times 7 \end{array}$	$\begin{array}{r} 8 \\ \times 8 \end{array}$	$\begin{array}{r} 5 \\ \times 7 \end{array}$	$\begin{array}{r} 7 \\ \times 10 \end{array}$	$\begin{array}{r} 7 \\ \times 8 \end{array}$	$\begin{array}{r} 5 \\ \times 9 \end{array}$	$\begin{array}{r} 9 \\ \times 10 \end{array}$	$\begin{array}{r} 6 \\ \times 1 \end{array}$
8.	$\begin{array}{r} 7 \\ \times 1 \end{array}$	$\begin{array}{r} 10 \\ \times 8 \end{array}$	$\begin{array}{r} 7 \\ \times 9 \end{array}$	$\begin{array}{r} 2 \\ \times 9 \end{array}$	$\begin{array}{r} 7 \\ \times 0 \end{array}$	$\begin{array}{r} 2 \\ \times 9 \end{array}$	$\begin{array}{r} 7 \\ \times 3 \end{array}$	$\begin{array}{r} 8 \\ \times 5 \end{array}$	$\begin{array}{r} 9 \\ \times 6 \end{array}$	$\begin{array}{r} 9 \\ \times 8 \end{array}$
9.	$\begin{array}{r} 2 \\ \times 7 \end{array}$	$\begin{array}{r} 6 \\ \times 8 \end{array}$	$\begin{array}{r} 1 \\ \times 2 \end{array}$	$\begin{array}{r} 8 \\ \times 7 \end{array}$	$\begin{array}{r} 7 \\ \times 5 \end{array}$	$\begin{array}{r} 8 \\ \times 2 \end{array}$	$\begin{array}{r} 7 \\ \times 1 \end{array}$	$\begin{array}{r} 7 \\ \times 3 \end{array}$	$\begin{array}{r} 3 \\ \times 9 \end{array}$	$\begin{array}{r} 7 \\ \times 2 \end{array}$
10.	$\begin{array}{r} 8 \\ \times 9 \end{array}$	$\begin{array}{r} 1 \\ \times 7 \end{array}$	$\begin{array}{r} 2 \\ \times 7 \end{array}$	$\begin{array}{r} 9 \\ \times 8 \end{array}$	$\begin{array}{r} 0 \\ \times 4 \end{array}$	$\begin{array}{r} 9 \\ \times 4 \end{array}$	$\begin{array}{r} 3 \\ \times 7 \end{array}$	$\begin{array}{r} 7 \\ \times 7 \end{array}$	$\begin{array}{r} 1 \\ \times 8 \end{array}$	$\begin{array}{r} 7 \\ \times 6 \end{array}$

MULTIPLICACIÓN EN FORMA DE REJILLA LATTICE MULTIPLICATION

Suggested Use: Use Lattice Multiplication as a "fun" way for students to check their multiplication problems.

Ejemplo: 328×26

Example: 328×26



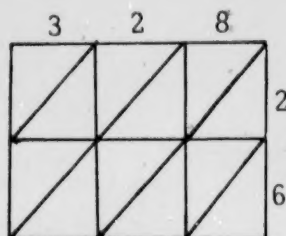
1. Dibuja un rectángulo de 3 x 2

1. Draw a 3 x 2 rectangle.



2. En cada cuadrado traza una diagonal desde el ángulo superior de la derecha hasta el ángulo inferior de la izquierda.

2. In each square, draw a diagonal from the upper righthand corner to the lower lefthand corner.



3. Escribe 328 sobre los cuadrados de arriba, como indica la figura; y 26 enfrente de los cuadrados a la derecha como en la figura.

3. Write 328 across the top and 26 along the right hand side.



$$\begin{aligned} 2 \times 8 &= 16 \\ 2 \times 2 &= 4 \\ 2 \times 3 &= 6 \end{aligned}$$

4. Multiplica 328 por 2. Escribe las cifras del producto en los cuadrados apropiados, una cifra en cada triángulo. Si el producto tiene una sola cifra, se escribe en el triángulo de abajo. Si tiene dos cifras, las unidades se escriben en el triángulo de abajo a la derecha, y las decenas en el triángulo de arriba. (Fíjate que en este tipo de multiplicación no necesitan "llevar", sino que se escribe el producto entero.)

4. Multiply 328 by 2. Write the digits of the product in the appropriate squares, one digit per triangle. If the product is a one-digit number, write the digit in the lower triangle. If it is a two-digit number, write the righthand (units) digit in the lower triangle and the lefthand (tens) digit in the upper triangle. Notice that you do not "carry" in this type of multiplication; you write the entire product.



5. Multiplica 328 por 6; escribe los productos en los cuadrados correspondientes, una cifra en cada triángulo.

5. Multiply 328 by 6, writing the products in the appropriate squares, one digit per triangle.



$$328 \times 26 = 8,528$$

6. Suma las cifras siguiendo las líneas formadas por las diagonales. (Fíjate en la ilustración.) Tienes que "llevar" las decenas, centenas, etc. cuando sea necesario, como en la suma normal. La suma será el producto de la multiplicación.

6. Add the digits in the rows formed by the diagonals, "carrying" when necessary, and you will get the product.

NOMBRE - NAME _____

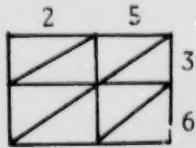
HOJA DE TRABAJO
WORKSHEET

MULTIPLICACIÓN EN FORMA DE REJILLA - LATTICE MULTIPLICATION

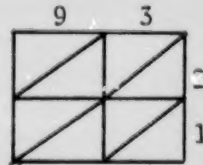
Resuelve cada problema y después compruébalo, usando la multiplicación en forma de rejilla.

Work each problem, and then check it by using lattice multiplication.

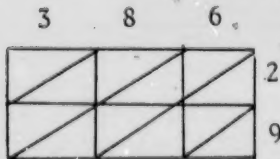
1. $\begin{array}{r} 25 \\ \times 36 \\ \hline \end{array}$



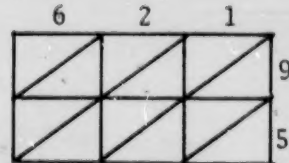
2. $\begin{array}{r} 93 \\ \times 21 \\ \hline \end{array}$



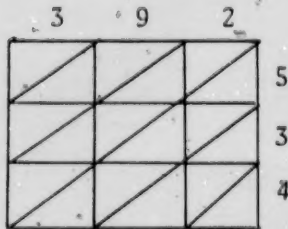
3. $\begin{array}{r} 386 \\ \times 29 \\ \hline \end{array}$



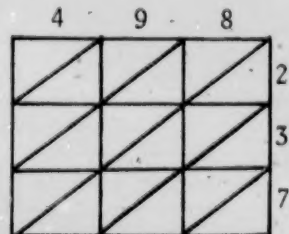
4. $\begin{array}{r} 621 \\ \times 95 \\ \hline \end{array}$



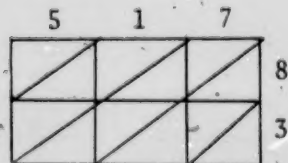
5. $\begin{array}{r} 392 \\ \times 534 \\ \hline \end{array}$



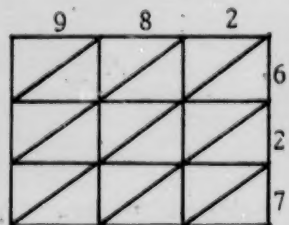
6. $\begin{array}{r} 498 \\ \times 237 \\ \hline \end{array}$



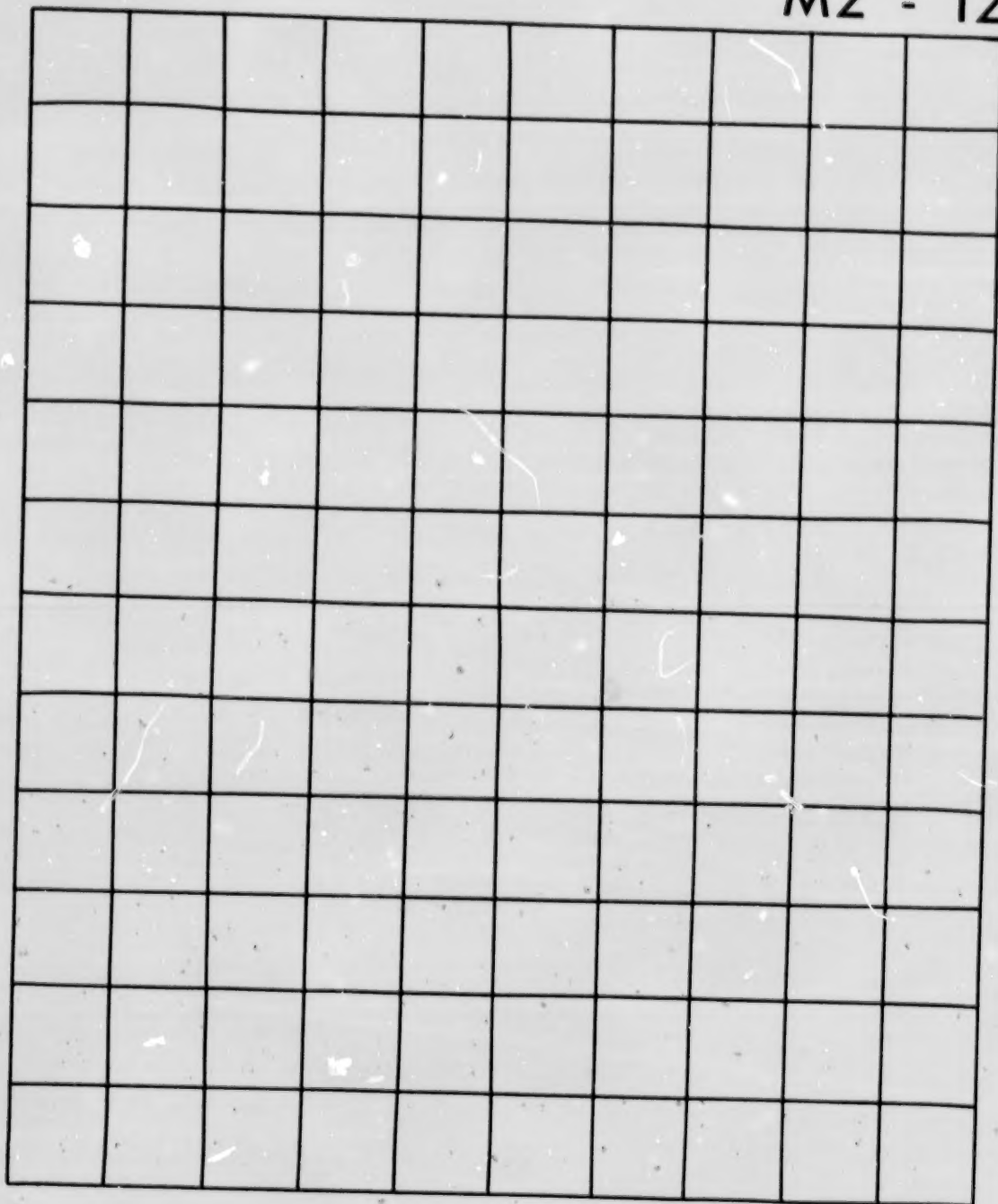
7. $\begin{array}{r} 517 \\ \times 83 \\ \hline \end{array}$



8. $\begin{array}{r} 982 \\ \times 627 \\ \hline \end{array}$



M2 - 12



M2 - 13

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

NOMBRE - NAME _____

HOJA DE TRABAJO
WORKSHEET

Expresa cada número como el producto de sus factores primos, usando los símbolos dados para representar los factores.

Express each number as the product of its prime factors, using the given symbols to represent the factors.

1 	2 	3 	4
5 	6	7 	8
9 	10	11 	12
13 	14	15	16
17	18	19 	20
21	22	23 	24
25 	26	27	28
29	30	31 	32
33 	34	35	36
37 	38	39	40
41	42	43 	44
45	46	47 	48
49	50		

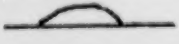
NOMBRE - NAME _____

HOJA DE TRABAJO _____

WORKSHEET

Expresa cada número como el producto de sus factores primos, usando los símbolos dados en esta hoja de trabajo y en la hoja de trabajo de M2-14.

Express each number as the product of its prime factors, using the symbols which are given on this worksheet and on Worksheet M2-14.

51	52	53 	54
55 	56	57	58
59	60	61 	62
63 	64	65	66
67 	68	69	70
71	72	73	74
75 	76	77	78
79 	80	81	82
83	84	85	86
87	88	89 	90
91	92	93	94
95	96	97 	98
99	100		

M2 - 152

EXÁMENES/TESTS

NIVEL 2/LEVEL 2

NIVEL 2 / EXAMEN 1

Nombre _____ Fecha _____

Profesor _____ Período _____

Consejero _____ Calificación _____

Resuelve estos problemas, haciendo la operación que se indica en cada uno.

$$\begin{array}{r} 1. \quad 7 \\ \quad 5 \\ \quad 3 \\ \hline \quad +8 \end{array}$$

$$\begin{array}{r} 2. \quad 905 \\ \quad 273 \\ \hline \quad +964 \end{array}$$

$$3. \quad 28 + 117 + 5 + 2,063$$

$$4. \quad 582 + 60 + 3,785 =$$

$$\begin{array}{r} 5. \quad 38 \\ \hline \quad -16 \end{array}$$

$$\begin{array}{r} 6. \quad 83 \\ \hline \quad -46 \end{array}$$

$$\begin{array}{r} 7. \quad 800 \\ \hline \quad -629 \end{array}$$

$$\begin{array}{r} 8. \quad 705 \\ \hline \quad -436 \end{array}$$

$$\begin{array}{r} 9. \quad 39 \\ \hline \quad \times 4 \end{array}$$

$$\begin{array}{r} 10. \quad 308 \\ \hline \quad \times 47 \end{array}$$

$$\begin{array}{r} 11. \quad 347 \\ \hline \quad \times 206 \end{array}$$

$$\begin{array}{r} 12. \quad 748 \\ \hline \quad \times 236 \end{array}$$

$$13. \quad 9 \overline{) 306}$$

$$14. \quad 14 \overline{) 252}$$

$$15. \quad 32 \overline{) 1,628}$$

$$16. \quad 417 \overline{) 15,036}$$

Descompón en factores primos los números siguientes. (Escribe las respuestas en notación exponencial.)

$$17. \quad 56$$

$$18. \quad 400$$

Encuentra el máximo factor común (M.F.C.) y el mínimo común múltiplo (M.C.M.) de los siguientes conjuntos de números.

$$16, 18, 24$$

$$25, 30, 50$$

$$19. \quad \text{M.F.C.} =$$

$$21. \quad \text{M.F.C.} =$$

$$20. \quad \text{M.C.M.} =$$

$$22. \quad \text{M.F.C.} =$$

23. Jugando a los bolos Marta hizo tanteos de 128, 137 y 96. ¿Cuál fue la suma total de los tanteos?

24. En un salón de clase había ocho filas de seis niños cada una. ¿Cuántos niños había en la clase?

25. Un obrero sembró 450 plantas de tomate en nueve filas, con el mismo número de plantas en cada fila. ¿Cuántas plantas había en cada fila?

LEVEL 2 / TEST 1

Name _____ Date _____

Teacher _____ Period _____

Advisor	Score
---------	-------

Perform the operation indicated:

$$\begin{array}{r} 1. \quad 7 \\ 5 \\ 3 \\ +8 \end{array}$$

$$\begin{array}{r} 2. \quad 905 \\ 273 \\ +964 \\ \hline \end{array}$$

3. $28 + 117 + 5 + 2,063 =$

4. $582 + 60 + 3,785 =$

$$\begin{array}{r} 5. \quad 38 \\ -16 \\ \hline \end{array}$$

$$\begin{array}{r} 6. \quad 83 \\ -46 \\ \hline \end{array}$$

$$\begin{array}{r} 7. \quad 800 \\ - 629 \\ \hline \end{array}$$

8. 705
-436

$$\begin{array}{r} 9. \quad 39 \\ \times 4 \\ \hline \end{array}$$

$$\begin{array}{r} 10. \quad 308 \\ \times 47 \\ \hline \end{array}$$

11. $\begin{array}{r} 347 \\ \times 206 \\ \hline \end{array}$

$$\begin{array}{r} 12. \quad 748 \\ \times 235 \\ \hline \end{array}$$

13. $9 \overline{) 306}$

14. $14 \overline{) 252}$

15. $32 \overline{) 1,628}$

16. $417 \overline{) 15,036}$

Factor completely. (Show the answer in exponent notation).

17. 56

18. 400

Find the greatest common factor (GCF) and the least common multiple (LCM) of each of the following sets of numbers.

16, 18, 24

25, 30, 50

19. GCF =

21. GCF =

20. LCM =

22. LCM =

23. Martha bowled 128, 137 and 96. What was her total score for three games?

24. In a classroom, there were eight rows of students with six students in each row. How many students were in the class?

25. A farmer planted 450 tomato plants in nine rows, placing an equal number of plants in each row. How many plants were in each row?

NIVEL 2 / EXAMEN 2

Nombre _____ Fecha _____

Profesor _____ Período _____

Consejero _____ Calificación _____

Resuelve estos problemas, haciendo la operación que se indica.

- | | | | |
|---|--|--|--|
| 1. $\begin{array}{r} 6 \\ 9 \\ 8 \\ +5 \\ \hline \end{array}$ | 2. $\begin{array}{r} 708 \\ 354 \\ +692 \\ \hline \end{array}$ | 3. $595 + 30 + 4,872 =$ | 4. $26 + 793 + 4 + 2,085 =$ |
| 5. $\begin{array}{r} 49 \\ -16 \\ \hline \end{array}$ | 6. $\begin{array}{r} 72 \\ -43 \\ \hline \end{array}$ | 7. $\begin{array}{r} 604 \\ -238 \\ \hline \end{array}$ | 8. $\begin{array}{r} 500 \\ -139 \\ \hline \end{array}$ |
| 9. $\begin{array}{r} 48 \\ \times 7 \\ \hline \end{array}$ | 10. $\begin{array}{r} 803 \\ \times 74 \\ \hline \end{array}$ | 11. $\begin{array}{r} 478 \\ \times 326 \\ \hline \end{array}$ | 12. $\begin{array}{r} 438 \\ \times 602 \\ \hline \end{array}$ |
| 13. $9 \overline{) 603}$ | 14. $42 \overline{) 1,827}$ | 15. $596 \overline{) 28,043}$ | 16. $35 \overline{) 82,765}$ |

Descompón en factores primos los números siguientes. (Escribe las respuestas en notación exponencial.)

17. 84

18. 300

Encuentra el máximo factor común (M.F.C.) y el mínimo común múltiplo (M.C.M.) de los siguientes conjuntos de números.

24, 36, 60

10, 20, 25

- | | |
|--------------------|--------------------|
| 19. M.F.C. = _____ | 21. M.F.C. = _____ |
| 20. M.C.M. = _____ | 22. M.C.M. = _____ |

23. Hay 593 estudiantes en la escuela Zapata. Un día solamente 566 estudiantes estuvieron presentes. ¿Cuántos estudiantes estuvieron ausentes?
24. Un tren expreso puede viajar a 105 millas por hora. Un avión puede viajar seis veces más rápido que el tren. ¿Cuál es la velocidad del avión?
25. En los Estados Unidos, según un estudio reciente, había 4,800 bancos nacionales, 1,750 bancos del estado, 612 bancos de ahorro y 9,353 bancos de otros tipos. ¿Cuál es el número total de bancos en los Estados Unidos?

LEVEL 2 / TEST 2

Name _____ Date _____

Teacher _____ Period _____

Advisor _____ Score _____

Perform the operation indicated:

$$\begin{array}{r} 1. \quad 6 \\ 9 \\ 8 \\ +5 \\ \hline \end{array}$$

$$\begin{array}{r} 2. \quad 708 \\ 354 \\ +692 \\ \hline \end{array}$$

3. $595 + 30 + 4,872 =$

4. $26 + 793 + 4 + 2,085 =$

$$\begin{array}{r} 5. \quad 49 \\ -16 \\ \hline \end{array}$$

$$\begin{array}{r} 6. \quad 72 \\ -43 \\ \hline \end{array}$$

7. 604
 -238

$$\begin{array}{r} 8. \quad 500 \\ -139 \\ \hline \end{array}$$

9.
$$\begin{array}{r} 48 \\ \times 7 \\ \hline \end{array}$$

$$\begin{array}{r} 10. \quad 803 \\ \times 74 \\ \hline \end{array}$$

11.
$$\begin{array}{r} 478 \\ \times 326 \\ \hline \end{array}$$

$$\begin{array}{r} 12. \quad 438 \\ \times 602 \\ \hline \end{array}$$

13. $9 \overline{) 603}$

14. $42 \overline{) 1,827}$

15. $596 \overline{) 28,043}$

16. $35 \overline{) 82,765}$

Factor completely. Show answers in exponent notation.

17. 84

18. 300

Find the greatest common factor (GCF) and the least common multiple (LCM) for each of the following:

24, 36, 60

10, 20, 25

19. GCF = _____

21. GCF = _____

20. LCM = _____

22. LCM = _____

23. There are 593 pupils in Zapata School. One day only 566 were present. How many were absent?

24. An express train travels at a speed of 105 miles per hour. A jet plane can travel six times as fast. How fast can the jet plane travel?

25. A recent count showed that in the United States there were 4,800 national banks, 1,750 state banks, 612 mutual savings banks, and 9,353 other banks. Find the total number of banks in the United States.

LA MEDIDA

OVERVIEW OF LEVEL 3

LA MEDIDA

OVERVIEW OF LEVEL 3

Level 3 consists chiefly of a study of the English system of measurement -- capacity measure (both liquid and dry), weight measure, and linear measure. It also includes a study of measures of time.

BEHAVIORAL OBJECTIVES

1. Given three faces of 12-hour clocks indicating different times of day, the student will state the time in writing with 100% accuracy.
2. Given a table of weight measure in the English system and three measures of weight, the student will convert the measures from the units in which they are expressed to other specified units in the English system with 66% accuracy.
3. Given a table of time measure and five measures of time, the student will convert the measures from the units in which they are expressed to other specified units of time and 80% accuracy.
4. Given a table of capacity (liquid and dry) measure in the English system and six capacity measures, the student will convert the measures from the units in which they are expressed to other specified units in the English system with 83% accuracy.
5. Given a table of linear measure in the English system and four linear measures, the student will convert the measures from the units in which they are expressed to other specified units in the English system with 75% accuracy.
6. Given four addition and/or subtraction problems involving measures in the English system, the student will perform the indicated operation with 75% accuracy.

CONTRASTIVE FEATURES

The student who has recently moved to the United States from a Hispanic country will be familiar only with the metric system of measurement. In order to function competently in the system of measurement used in the United States, the student will need to develop basic concepts of the units of measure of the English system. The best procedure for accomplishing this is to give him concrete models of these units having him handle them and use them to measure objects. These concrete models should include gallon, quart, and pint milk cartons, rulers and yard sticks, scales having

the basic unit of ounces. Special attention should be given to the Hispanic student in order to help him learn the English words which name these units, as well as to develop a basic concept of them.

HOURS OF THE DAY, MINUTES, SHORTCUTS TO MINUTES

LESSONS 3-1, 3-2, 3-3

Student Booklet p. 3

CONCEPT

Telling time using a 12-hour clock

VOCABULARY

hora	hour
horario (aguja o manecilla de las horas)	hour hand
medianoche	midnight
mediodía	noon
minutero	minute hand
minuto	minute
reloj	clock
segundo	second

RESOURCES

1. Transparency of a 12-hour clock, with an overlay of a minute hand and hour hand (Pattern M3-1)
2. Clocks made by the students
3. Scissors

OPTIONAL RESOURCE

Filmstrip: TELLING TIME, Mathematics Film Loops (Primary), Houghton-mifflin Co.

PROCEDURE

Pida a los estudiantes que cada uno dibuje una esfera de reloj en cartón o cartulina siguiendo el modelo que va en la Lección 3-2. Después pídale que dibujen y

Have each of the students draw the face of a clock on construction paper or on cardboard, using the pattern in Lesson 3-2. Then have them draw and cut out an hour

recorten las manecillas para el reloj. Enséñeles después cómo sujetar el horario (la aguja de las horas) en el centro de la esfera con una tachuela, de modo que pueda rotar.

Usando la transparencia de reloj y sobreponiendo una manecilla horaria, diga a los estudiantes que por un corto tiempo van a usar un reloj sin minutero. Explíqueles que usando este tipo de reloj:

1. Cuando el horario (la aguja de las horas) está directamente enfrente de un número indica la hora exactamente.
2. Mientras se mueve de un número a otro sabemos la hora pero no los minutos. El primer número indica la hora.

hand and a minute hand. Show them how to fasten the hour hand to the center of his clock, using a brad so that it can be moved easily to different positions.

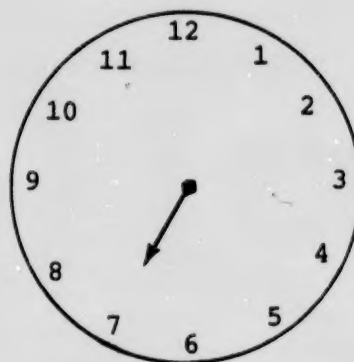
Making use of a transparency and an overlay of an hour hand, tell the students that for a short while they are going to use clocks that do not have minute hands. Explain that, using this type of clock:

1. When the hour hand points directly to a number, we know the time of day.
2. While the hour hand is moving from one number to the next, we know only the hour of the day, not the exact time of day.

Examples - Ejemplos



3:00 Las tres en punto
3:00 Three o'clock



La hora es 7.
The hour is 7.

Mueva la aguja a diversas posiciones y pregunte a los estudiantes qué hora indica el reloj. Después pídale que indiquen en sus relojes las horas que usted les vaya dando y que las digan en alta voz mostrándoles el reloj a los otros estudiantes.

Después pídale que pongan el minutero en el centro de la esfera sobre la aguja de las horas. Sobreponiendo una transparencia con un minutero, explíqueles como se usan los números para indicar los minutos, y pídale que lo expresen en voz alta y por escrito. Después pídale que indiquen en sus relojes las horas que usted les vaya indicando. Después explíqueles las diversas formas de expresar la misma hora en inglés. Por ejemplo, "las 6:55" se puede expresar: "las seis cincuenta y cinco" o "las siete menos cinco".

Move the hour hand to different positions and ask the students to tell what hour the clock indicates. Then, ask them to indicate certain hours on their clocks to express the time aloud while showing their clocks to the other students.

Next, have each of the students fasten the minute hand to the center of his clock. Placing an overlay of a minute hand on the transparency of a clock, explain how the numerals are used to express the minutes. Indicate different times of day asking the students to express these orally and in writing. Have them indicate certain times on their clocks. Then explain alternate ways of expressing the same time of day. For example, 6:55 can be expressed "six fifty-five" or "five minutes until seven."

MEASUREMENT BY PICTURES

SMALL TO LARGE MEASUREMENT BY PICTURES

LESSONS 3-4 and 3-5

Student Booklet p. 19

CONCEPTS

Use of standard units of capacity in the English system
Conversion from one unit of capacity to another in the English system

VOCABULARY

capacidad
cuarto
cuchara

capacity
quart
tablespoon

cucharada
cucharilla
galón
medidas para líquidos
onza
pinta
taza

tablespoonful
teaspoon
gallon
liquid measure
ounce
pint
cup

RESOURCES

1. A container filled with a minimum of a gallon of water
2. 1 milk carton of each of the following measures from the local dairy:
1 gallon, 1 quart, and 1 pint
3. 1 measuring cup
4. 1 tablespoon
5. 1 teaspoon

PROCEDURE

Introduzca las medidas equivalentes utilizando las ilustraciones que se dan en las Lecciones 3-4 y 3-5. Después, usando envases y agua, demuestre estas medidas equivalentes.

Llene de agua el cartón de un galón vertiendo en él el contenido de cuatro cuartos. Después deje que los estudiantes usen un envase pequeño (por ejemplo, de una pinta) para llenar un envase más grande (de un cuarto, por ejemplo), dejando que ellos determinen el número de envases pequeños que son necesarios para llenar el grande. Presénteles muchos ejemplos de las medidas de líquidos que se dan en esta lección y haciendo que varios estudiantes participen en la presentación de los ejemplos.

Escribe los resultados en la pizarra:

1 galón = 4 cuartos
1 cuarto = 2 pintas, etc.

Introduce the equivalent measures, together with their illustrations, which are given in Lesson 3-4 and 3-5. Then give a physical demonstration of these measures, using containers filled with water.

Fill the gallon carton with water by pouring into it four quart containers of water. Then let the students use a smaller container (for example, a pint) to fill a larger container (for example, a quart). Have them determine the number of smaller containers needed to fill the larger one. Give many examples, illustrating all the liquid measures given in the lesson, and allow several students to participate.

Write the results on the chalkboard:

1 gallon = 4 quarts
1 quart = 2 pints, etc.

CHANGING LARGER UNITS OF MEASURE TO SMALLER UNITS OF MEASURE

CHANGING SMALLER UNITS OF MEASURE TO LARGER UNITS OF MEASURE

LESSONS 3-6, 3-7

Student Booklet p. 31

CONCEPTS

Conversion from larger units of measure to smaller units of measure

Conversion from smaller units of measure to larger units of measure

VOCABULARY

cuarto
cuchara
cucharada
cucharilla
galón
onza
pie
pinta
pulgada
unidad de medida mayor
unidad de medida menor

quart
tablespoon
tablespoonful
teaspoon
gallon
ounce
foot
pint
inch
larger unit of measure
smaller unit of measure

RESOURCES

1. A container filled with a minimum of a gallon of water
2. 1 milk carton of each of the following measures from the local dairy:
1 gallon, 1 quart, and 1 pint
3. 1 measuring cup
4. 1 tablespoon
5. 1 teaspoon

OPTIONAL RESOURCES

Tape: LINEAR MEASURE (MM-42). Grade 6 Math Tape Package.
Holt Math Tapes 1-8, Holt, Rinehart and Winston.

PROCEDURE

Como hizo en las Lecciones 3-4,
3-5, use envases llenos de agua

As you did in Lessons 3-4, 3-5,
use the containers filled with water

para presentar visualmente cuántos envases, o mejor el contenido de cuántos envases pequeños caben en el envase grande. Por ejemplo, una pinta contiene dos tazas). Después siguiendo la tabla de flujo de la Lección 3-6 y desarrollando varios ejemplos, muéstreles cómo las unidades grandes de medidas se pueden convertir a unidades menores. Y trabajando con varios ejemplos, muéstreles cómo las unidades grandes de medidas se pueden convertir a unidades menores.

Siguiendo el mismo procedimiento y usando la tabla de flujo de la Lección 3-7, enséñeles a convertir unidades mayores mediante cálculos escritos.

to demonstrate how many smaller units are contained in a larger one. For example, one pint contains two cups. (Show the students that three pints contain six cups.) Then, using the flow chart in Lesson 3-6 and working several examples, show how larger units of measure can be changed to smaller units of measure.

Following the same procedure, and making use of the flow chart in Lesson 3-7, show how to change smaller units of measure to larger units of measure by means of written calculations.

USING MEASURES OF TIME

LESSON 3-8

Student Booklet p. 39

CONCEPTS

The use of measures of time

The conversion from one unit of time to another

VOCABULARY

año
día
hora
medidas de tiempo
mes
minuto
segundo
semana
siglo

year
day
hour
measures of time
month
minute
second
week
century

RESOURCES

1. Transparency of a clock (M3-1)
2. Calendar

PROCEDURE

Explique la tabla de medidas de tiempo que se da en la Lección 3-3. Use un reloj y un calendario para presentar visualmente las relaciones entre las diversas medidas.

Por ejemplo: 1 hora = 60 minutos
1 semana = 7 días.

Presente y explique varios problemas que requieran el cambio de unidades grandes de tiempo a unidades menores y viceversa.

Procure que tales problemas sean de aplicación práctica en la vida de los estudiantes.

Ejemplos:

1. a. ¿Cuántas pulsaciones por minuto tiene tu pulso?
b. Si tu pulso es uniforme y constante, a la misma velocidad de la parte a.
 - i. ¿Cuántas pulsaciones tendrás en 5 minutos?
 - ii. ¿Cuántas en una hora?
2. Imagínate que la semana pasada viste tu programa favorito de tele que dura una hora, cinco días de la semana.

Explain the table of measures of time in Lesson 3-8, using a clock and a calendar to give visual images of some of the relationships.

For example: 1 hour = 60 minutes
1 week = 7 days

Present and explain several problems which require changing from larger units of time to smaller and/or from smaller units of time to larger units.

These problems should be relevant to the lives of the students.

Examples:

1. a. How many times does your pulse beat in a minute?
b. If your pulse beats steadily at the same rate as in part a.
 - i. How many times will it beat in 5 minutes?
 - ii. How many times will it beat in an hour?
2. Suppose that you watched your favorite TV program one hour a day for five days last week.

- a. ¿Cuántos minutos pasaste viendo el programa durante la semana?
- b. ¿Cuántos segundos pasaste la semana pasada viendo el programa?

- a. How many minutes did you spend watching the program?
- b. How many seconds did you spend watching it?

USING DRY MEASURE, USING LIQUID MEASURE

LESSONS 3-9, 3-10

Student Booklet p. 43

CONCEPTS

Use of liquid measures and dry measures

Conversion from one unit of liquid measure or dry measure to another

VOCABULARY

bushel
cuarto árido
cuchara
cucharada
cucharilla
galón
medidas para áridos
medidas para líquidos
pinta
pinta árida
peck
taza

bushel
dry quart
tablespoon
tablespoonful
teaspoon
gallon
dry measures
liquid measures
pint
dry pint
peck
cup

RESOURCES

1. A basket of each of the following measures: 1 bushel, 1 peck, and dry quart, 1 dry pint
2. A container filled with a minimum of a gallon of water
3. 1 milk carton of each of the following measures from the local dairy: 1 gallon, 1 quart, and 1 pint
4. 1 measuring cup
5. 1 tablespoon
6. 1 teaspoon

PROCEDURE

Explique a los estudiantes la diferencia entre medidas para áridos y las medidas para líquidos. Muéstreles los diferentes envases y medidas que generalmente se usan para cada tipo de medidas.

Explain the difference between dry measure and liquid measure, showing the students the different containers which are generally used for each.

Desarrolle con los estudiantes los ejemplos que van al principio de las Lecciones 3-9 y 3-10, explicándoselos paso por paso.

Discuss with the students the examples at the beginning of Lessons 3-9 and 3-10, explaining them step by step.

USING MEASURES OF WEIGHT

USING MEASURES OF LENGTH

LESSONS 3-11, 3-12

Student Booklet p. 51

CONCEPTS

Use of measures of weight and measures of length
Conversion from one unit of weight or length to another

VOCABULARY

libra
medidas de longitud (medidas lineales)
medidas de peso
milla
onza
pie
pulgada
quintal (peso de cien libras)
tonelada (ton)
yarda

pound
measures of length (linear measures)
measures of weight
mile
ounce
foot
inch
hundred weight
ton
yard

RESOURCES

1. Scale which measures weight in pounds
2. Yardstick
3. 12-inch ruler

PROCEDURE

Explíqueles la tabla de medidas de peso que va en la Lección 3-11.

Haga que cada estudiante se pese en la báscula (balanza) y que después determine aproximadamente cuántas veces se necesitaría su peso (cuántos "de él") para completar una tonelada. Desarrolle los ejemplos que se dan al principio de la Lección 3-11, explicándoselos paso por paso.

Explíqueles la tabla de medidas lineales o de longitud, de la Lección 3-12. Usando una regla muéstreles que 1 pie = 12 pulgadas.

Para demostrar el hecho de que 1 yarda = 3 pies, haga que un estudiante ponga sobre una medida de una yarda tantas reglas como sean necesarias para cubrirlo de extremo a extremo. Después pida a los estudiantes que determinen cuántas pulgadas tiene una yarda. Desarrolle los ejemplos que se dan al principio de la Lección 3-12, y explíqueles detalladamente.

Actividad

Divida a la clase en grupos de tres estudiantes y organice una "búsqueda de medidas". Déle a cada grupo una lista de mediadas pídales que busquen en la clase objetos que tengan la misma longitud que las medidas de la lista. He aquí algunos objetos que puedan encontrar y sus medidas.

Explain the table of measures of weight in Lesson 3-11.

Have each child weigh himself on a scale and then determine approximately how many times his weight (how many of "him") would be needed to make up a ton. Discuss the examples at the beginning of Lesson 3-11, explaining them step by step.

Explain the table of linear measures in Lesson 3-12. Making use of a ruler, show that 1 foot = 12 inches.

To demonstrate the fact that 1 yard = 3 feet, have a student place end to end on top of a yardstick as many rulers as are needed to cover it. Then ask the students to determine how many inches are in a yard. Discuss the examples at the beginning of Lesson 3-12, explaining them carefully.

Activity

Divide the class into groups of three students each, and have a measurement scavenger hunt. Giving a list of measures, to each group, ask the students to find objects in the classroom having the same lengths as these measures. For example, one group might find the following objects:

MEDIDA	OBJETO
1 1/4 pulgadas	-sujetapapeles
2 1/2 pulgadas	-un trozo de chicle
6 1/8 pulgadas	-una barra de chocolate
1 yd. 1 1/2 pies	-altura de un estudiante

MEASURE	OBJECT
1 1/4 inches	-paper clip
2 1/2 inches	-piece of gum
6 1/8 inches	-a bar of chocolate candy
1 yd. 1 1/2 ft.	-height of one of the students

ADDING MEASUREMENTS

LESSON 3-13

Student Booklet p. 59

CONCEPT

Addition of measurements

OPTIONAL RESOURCES

Tape: LIQUID MEASURE (MM-43). Grade 6 Math Tape Package. Holt Math Tapes 1-8, Holt, Rinehart and Winston.

PROCEDURE

Explíqueles cómo simplificar medidas, expresándolas en la unidad de medidas más grande posible.

Ejemplo a: 2 galones y 5 cuartos

Puesto que 1 galón = 4 cuartos
5 cuartos = 1 galón y 1 cuarto

Sumando: 2 galones
+1 galón y 1 cuarto

Solución: 3 galones y 1 cuarto

Ejemplo b: 10 pies y 20 pulgadas

Puesto que 1 yarda = 3 pies
10 pies = 3 yardas y 1 pie

Explain how to simplify measures by expressing them in terms of the largest unit of measure possible.

Example a: 2 gal. 5 qt.

Since 1 gal. = 4 qts.
5 qts. = 1 gal. 1 qt.

Now add 2 gal.
+1 gal. 1 qt.

Answer: 3 gal. 1 qt.

Example b: 10 ft. 20 in.

Since 1 yd. = 3 ft.
10 ft. = 3 yd. 1 ft.

Puesto que 1 pie = 12 pulgadas
 20 pulgadas = 1 pie y
 8 pulgadas

Sumando: 3 yardas, 1 pie
 1 pie, 8
 pulgadas
 3 yardas 2 pies 8
 pulgadas

Desarrolle los ejemplos de la
 Lección 3-13, explicándoles a los
 estudiantes cómo sumar medidas,
 y recordándoles que después de
 sumar deben simplificar la so-
 lución en lo posible.

Since 1 ft. = 12 in.
 20 in. = 1 ft. 8 in.

Now add 3 yd. 1 ft.
 1 ft. 8 in.
 3 yd. 2 ft. 8 in.

Discuss the examples in Lesson
 3-13, explaining to the student how
 to add measures, and reminding
 them that after adding they must
 simplify the answer if possible.

SUBTRACTING MEASUREMENTS

LESSON 3-14

Student Booklet p. 65

Concept

Subtraction of measurements

OPTIONAL RESOURCES

Tape: WEIGHT (MM-44)
 Grade 6 Math Tape Package
 Holt Math Tapes 1-8, Holt, Rinehart and Winston

PROCEDURE

Desarrolle los ejemplos de la
 Lección 13-14, explicándoles a
 los estudiantes cómo restar
 medidas. Recuérdeles que
 deberán simplificar en lo posible
 las soluciones.

Discuss the examples in Lesson
 3-14, explaining how to subtract
 measures. Remind the students
 that they must simplify the answer
 if possible.

CLAVE/ANSWER KEY

**MANUAL DEL ESTUDIANTE
STUDENT BOOKLET**

NIVEL 3/LEVEL 3

CLAVE/ANSWER KEY

MANUAL DEL ESTUDIANTE/STUDENT BOOKLET

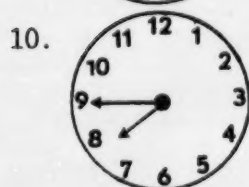
NIVEL 3/LEVEL 3

EJERCICIO 3-1/EXERCISE 3-1, pages 8-9

- | | |
|--------------------------------|-------------------------------------|
| 1. 7:00 en punto / 7 o'clock | 4. La hora es 11. / The hour is 11. |
| 2. La hora es 9. / The hour is | 5. La hora es 2. / The hour is 2. |
| 3. 8:00 en punto / 8 o'clock | 6. La hora es 4. / The hour is 4. |

EJERCICIO 3-2/EXERCISE 3-2, pages 12-13

1. 4:10
2. 5:50
3. 3:40
4. 5:55
5. 1:40
6. 12:25
7. 5:00
8. 1:50



13.



14.



15.



16.



EJERCICIO 3-3/EXERCISE 3-3, pages 16-17

- | | |
|--|--|
| 1. 1:50
10 minutos antes de las 2
(10 para las 2)
10 min. until 2 | 5. 3:35
25 minutos antes de las 4
25 min. until 4 |
| 2. 2:40
20 minutos antes de las 3
(20 para las 3)
20 min. until 3 | 6. 8:30
Las ocho y media
(las 8 con 30 minutos)
half past 8 |
| 3. 10:30
las diez y media
(las 10 con 30 minutos)
half past 10 | 7. 2:45
15 minutos antes de las 3
15 min. until 3 |
| 4. 7:55
5 minutos antes de las 8
(5 para las 8)
5 min. until 8 | 8. 9:25
25 minutos después de las 9
(las 9 con 25 minutos)
25 min. past 9 |

EJERCICIO 3-4/EXERCISE 3-4, pages 24-25

- | | |
|---------------------------|---|
| 1. 6 tazas - 6 cups | 6. 6 pintas - 6 pints |
| 2. 8 pintas - 8 pints | 7. 32 onzas - 32 ounces |
| 3. 20 cuartos - 20 quarts | 8. 96 onzas - 96 ounces |
| 4. 16 pintas - 16 pints | 9. 16 cuartos - 16 quarts |
| 5. 16 onzas - 16 ounces | 10. 32 cucharadas - 32 table-
spoons |

EJERCICIO 3-5/EXERCISE 3-5, pages 28-29

- | | |
|---------------------------------|---------------------------------------|
| 1. 8 cuartos - 8 quarts | 6. 9 cuartos - 9 quarts |
| 2. 2 tazas - 2 cups | 7. 6 cucharadas - 6 table-
spoons |
| 3. 5 cucharadas - 5 tablespoons | 8. 3 pintas - 3 pints |
| 4. 3 cuartos - 3 quarts | 9. 2 galones - 2 gallons |
| 5. 2 pintas - 2 pints | 10. 2 cucharadas - 2 table-
spoons |

EJERCICIO 3-6/EXERCISE 3-6, pages 32-33

- | | |
|---------------------------|----------------------------------|
| 1. 20 pintas - 20 pints | 5. 32 pintas - 32 pints |
| 2. 20 cuartos - 20 quarts | 6. 24 pintas - 24 pints |
| 3. 40 cuartos - 40 quarts | 7. 54 cucharillas - 54 teaspoons |
| 4. 20 tazas - 20 cups | 8. 12 tazas - 12 cups |

EJERCICIO 3-7/EXERCISE 3-7, pages 36-37

- | | |
|--------------------------|---------------------------------|
| 1. 3 pintas - 3 pints | 6. 5 pintas - 5 pints |
| 2. 2 cuartos - 2 quarts | 7. 16 cuartos - 16 quarts |
| 3. 2 galones - 2 gallons | 8. 7 pintas - 7 pints |
| 4. 7 galones - 7 gallons | 9. 4 cucharadas - 4 tablespoons |
| 5. 9 cuartos - 9 quarts | 10. 4 tazas - 4 cups |

EJERCICIO 3-8/EXERCISE 3-8, pages 40-41

- | | |
|----------------------------|-----------------------------------|
| 1. 300 segundos - 300 sec. | 10. 504 hr. |
| 2. 48 meses - 48 mo. | 11. 32 meses 32 mo. |
| 3. 2 min. | 12. 100 hr. |
| 4. 1 hr. | 13. 1,440 min. |
| 5. 10 semanas - 10 wk. | 14. 86,400 segundos - 86,400 sec. |
| 6. 192 hr. | 15. 7 décadas - 7 decades |
| 7. 3 días - 3 days | 16. 400 años - 400 yr. |
| 8. 4 años - 4 yr. | 17. 10 siglos - 10 centuries |
| 9. 5 min. | 18. 1 hr. |

EJERCICIO 3-9/EXERCISE 3-9, pages 44-45

- | | |
|------------------------|------------------------------------|
| 1. 2 pk. | 10. 5 pk. = 80 pt. |
| 2. 4 pk. | 11. 130 pt. |
| 3. 12 pk. | 12. 26 cuartos - 26 qt. |
| 4. 16 cuartos - 16 qt. | 13. 17 cuartos = 34 pintas |
| | 17 qt. = 34 pt. |
| 5. 3 bu. | 14. 2 bu. |
| 6. 64 cuartos - 64 qt. | 15. 15 cuartos áridos - 15 dry qt. |
| 7. 1 pk. | 16. 8 días - 8 days |
| 8. 6 pt. | |
| 9. 6 cuartos - 6 qt. | |

EJERCICIO 3-10/EXERCISE 3-10, pages 48-49

- | | |
|-------------------------------------|----------------------------------|
| 1. 4 pt. | 7. 96 cucharillas - 96 teaspoons |
| 2. 8 cuartos = 16 pintas = 32 tazas | 8. 5 cucharadas - 5 tablespoons |
| 8 qt. - 16 pt. = 32 cups | |
| 3. 36 cuartos - 36 qt. | 9. 21 tazas - 21 cups |
| 4. 6 tazas - 6 cups | 10. 14 tazas - 14 cups |
| 5. 2 gal. | 11. 3 cucharadas - 3 tablespoons |
| 6. 5 cuartos - 5 qt. | 12. 32 tazas - 32 cups |

EJERCICIO 3-11/EXERCISE 3-11, pages 52-53

- | | |
|-------------------------|----------------------------|
| 1. 2 toneladas - 2 tons | 7. 3,200 lb. |
| 2. 48 onzas - 48 ounces | 8. 12,400 lb. |
| 3. 64 onzas - 64 ounces | 9. 17 T. - 1,750 lb. |
| 4. 3 libras - 3 pounds | 10. 4 lb. |
| 5. 1 lb. | 11. 48 bolsillas - 48 bags |
| 6. 2 lb. | |

EJERCICIO 3-12/EXERCISE 3-12, pages 56-57

- | | |
|-----------------------------|-----------------------------|
| 1. 36 pulgadas - 36 in. | 7. 51 pulgadas - 51 in. |
| 2. 3 yd. | 8. 45 pulgadas - 45 in. |
| 3. 24 pulgadas - 24 in. | 9. 14 pies - 14 ft. |
| 4. 26,400 pies - 26,400 ft. | 10. 72 pulgadas - 72 inches |
| 5. 12 yd. | 11. 72 pulgadas - 72 inches |
| 6. 2 pies - 2 ft. | |

EJERCICIO 3-13/EXERCISE 3-13, pages 62-63

- | | |
|------------------------------------|---|
| 1. 8 pies 7 pulgadas - 8 ft. 7 in. | 10. 5 lb. 8 oz. |
| 2. 5 pies 8 pulgadas - 5 ft. 8 in. | 11. 8 lb. |
| 3. 13 pies - 13 ft. | 12. 21 lb. 12 oz. |
| 4. 9 pies 6 pulgadas - 9 ft. 6 in. | 13. 10 galones 2 cuartos - 10 gal. 2 qt. |
| 5. 5 hr. 55 min. | 14. 11 años - 11 yr. |
| 6. 3 hr. | 15. 10 semanas - 10 wk. |
| 7. 14 hr. 49 min. | 16. 13 días 4 horas 2 minutos - 13 da. 4 hr. 2 min. |
| 8. 28 pies - 28 ft. | |
| 9. 23 pies - 23 ft. | |

EJERCICIO 3-14/EXERCISE 3-14, pages 66-67

- | | |
|----------------------------|---|
| 1. 2 lb. 5 oz. | 6. 1 semana 5 días - 1 wk. 5 da. |
| 2. 8 lb. 13 oz. | 7. 5 yards 10 pulgadas 5 yd. 10 in. |
| 3. 8 lb. 13 oz. | 8. 1 yarda 2 pies - 1 yd. 2 ft. |
| 4. 9 min. | 9. 5 hr. 33 min. |
| 5. 5 años 0 mes o 4 años - | 10. 4 yardas 1 pie 4 pulgadas - 4 yd. 1 ft. 4 in. |
| yr. 0 mo. or 4 yr. | |

REPASO 3/REVIEW 3, pages 68-71

La Una Con 25 Minutos

- | | |
|--|---|
| 1. (25 minutos después de la una)
35 minutos antes de las 2
(35 minutos para las 2);
1:25 | 9. 64 pintas - 64 pints |
| 1. 25 min. past 1; 35 min. to 2;
1:25 | 10. 48 meses - 48 months |
| 2. las 10 con 5 minutos
(5 minutos después de las 10);
55 minutos antes de las 11);
10:05 | 11. 2 minutos - 2 minutes |
| 2. 5 min. past 10; 55 min. to 11;
10:05 | 12. 1 pecks |
| 3. las 10 con 40 minutos
(40 minutos después de las 10)
20 minutos antes de las 11
(20 minutos para las 11);
10:40 | 13. 2 toneladas - 2 tons |
| 4. 6 tazas - 6 cups | 14. 2,200 libras - 2,200 pounds |
| 5. 8 pintas - 8 pints | 15. 4 libras - 4 pounds |
| 6. 1 pinta - 1 pint | 16. 3 yardas - 3 yards |
| 7. 2 cucharadas - 2 tablespoons | 17. 2 pies - 2 feet |
| 8. 8 pecks | 18. 45 pulgadas - 45 inches |
| | 19. 288 pulgadas - 288 inches |
| | 20. 14 hr. 6 min. |
| | 21. 16 lb. 4 oz. |
| | 22. 11 galones 1 cuarto - 11 gal. 1 qt. |
| | 23. 5 lb. 9 oz. |
| | 24. 2 días - 2 days |
| | 25. 5 min. 45 seg. - 5 min. |
| | 26. 75 pulgadas - 75 inches |
| | 27. 10 cuartos - 10 quarts |
| | 28. 20 cuartos - 20 quarts |
| | 29. 314 lb. 11 oz. |
| | 30. 3:50 |

CLAVE/ANSWER KEY

EXÁMENES/TESTS

NIVEL 3/LEVEL 3

CLAVE/ANSWER KEY

EXAMEN 1/TEST 1

NIVEL 3/LEVEL 3

1. 8:10
2. 3:40
3. 12:25
4. 1 1/2 qt.
5. 8,000 lb.
6. 84 pulgadas - 84 in.
7. 21,120 pies - 21,120 ft.
8. 32 yd.
9. 3 días - 3 days
10. 900 lb.
11. 4 lb.
12. 6 tazas - 6 cups
13. 48 cuartos - 48 qt.
14. 9 cuartos - 9 qt.
15. 84 meses - 84 mo.
16. 4 hr.
17. 4 pk.
18. 3 pt.
19. 10 siglos - 10 centuries
20. 140 días - 140 days
21. 2 millas - 2 miles
22. 4 c. 1 pt. - 4 qt. 1 pt.
23. 6 lb. 1 oz.
24. 1 hr. 52 min.
25. 12 pecks

CLAVE/ANSWER KEY

EXAMEN 2/TEST 2

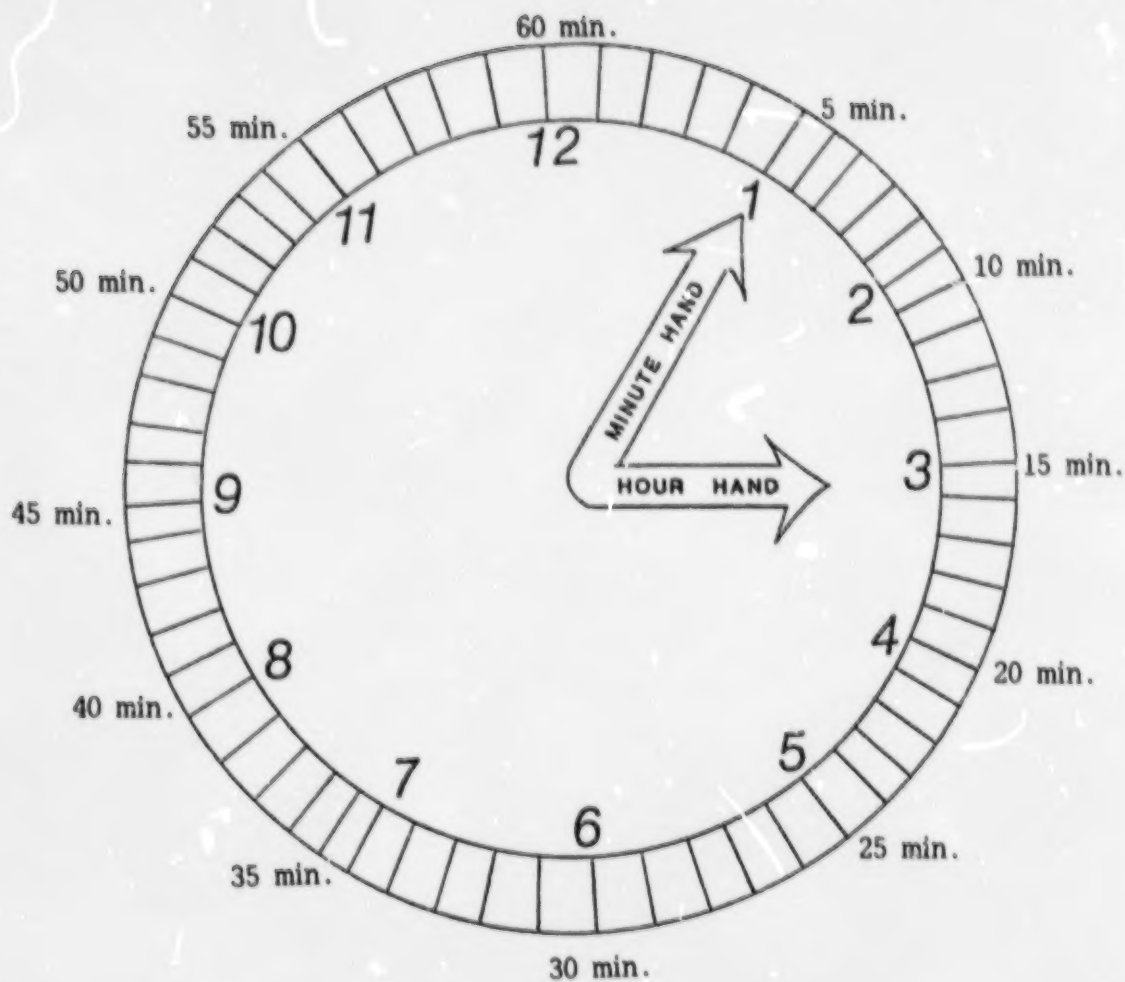
NIVEL 3/LEVEL 3

1. 3:40
2. 11:35
3. 1:25
4. 8 tazas - 8 cups
5. 4 pintas - 4 pints
6. 240 min.
7. 6 toneladas - 6 tons
8. 16 cuartos - 16 quarts
9. 36 pies - 36 ft.
10. 5 semanas - 5 weeks
11. 700 libras - 700 pounds
12. 64 cucharadas - 64 tbsp.
13. 15,840 ft. - 15,840 pies
14. 5 lb.
15. 56 cuartos - 56 qt.
16. 70 min.
17. 288 hr.
18. 4 años - 4 yr.
19. 5 cuartos - 5 qts.
20. 4 pies - 4 ft.
21. 84 pulg. - 84 in.
22. 4 gal. 1 c. - 4 gal. 1 qt.
23. 24 lb. 6 oz.
24. 13 semanas - 13 wk.
25. 1 yd. 2 pies - 1 yd. 2 ft.

**MODELOS Y ACTIVIDADES
PATTERNS AND ACTIVITIES**

NIVEL 3/LEVEL 3

M3 - 1



246

EXÁMENES/TESTS

NIVEL 3/LEVEL 3

NIVEL 3 / EXAMEN 1

Nombre _____ Fecha _____

Profesor _____ Período _____

Consejero _____ Calificación _____

Medidas de peso

16 oz. = 1 libra (lb.)
100 lb. = 1 quintal (peso de cien lbs.)
2000 lb. = 1 tonelada (T)

Medidas de tiempo

60 segundos = 1 minuto (min.)
60 min. = 1 hora (hr.)
24 hr. = 1 día
7 días = 1 semana
12 meses = 1 año
10 años = 1 década
100 años = 1 siglo

Medidas para líquidos y para áridos

3 cucharillas = 1 cucharada
16 cucharillas = 1 taza
2 tazas = 1 pinta (pt.)
2 pintas = 1 cuarto (c.)
4 cuartos = 1 galón
8 cuartos = 1 peck
4 pecks = 1 bushel
16 onzas fluidas = 1 pinta

Medidas de longitud

12 pulgadas (pulg.) = 1 pie (p.)
3 pies = 1 yards (yd.)
5,280 pies = 1 milla (mi.)

Escribe la hora:



1. _____



2. _____



3. _____

4. 3 pintas = _____ tazas
5. 4 toneladas = _____ libras
6. 7 pies = _____ pulgadas
7. 4 mi. = _____ pies
8. 96 pies = _____ yd.
9. 72 hr. = _____ días
10. 9 quintales = _____ libras
11. 64 onzas = _____ libras
12. 3 pintas = _____ tazas
13. 12 gal. = _____ cuartos
14. 18 pt. = _____ cuartos
15. 7 años = _____ meses
16. 240 min. = _____ hr.
17. 32 cuartos = _____ pecks
18. 48 oz. fl. = _____ pt.
19. 1000 años = _____ siglos
20. 20 semanas = _____ días
21. 10,560 pies = _____ mi.

22. 5 c. 2 pt.
-1 c. 1 pt.

23. 2 lb. 9 oz.
+3 lb. 8 oz.

24. 7 hr. 42 min.
-5 hr. 50 min.

25. 4 pecks 6 cuartos
+7 pecks 2 cuartos

LEVEL 3 / TEST 1

Name _____ Date _____

Teacher _____ Period _____

Advisor _____ Score _____

Measures of Weight

16 oz. = 1 lb.

100 lb. = 1 hundredweight (cwt.)

2,000 lb. = 1 Ton (T)

Measures of Time

60 sec. = 1 min.

60 min. = 1 hr.

24 hr. = 1 day

7 days = 1 week

12 mo. = 1 year

10 yr. = 1 decade

100 yr. = 1 century

Liquid & Dry Measure

3 tsp. = 1 tbsp.

16 tbsp. = 1 cup

2 cups = 1 pint

2 pt. = 1 qt.

4 qt. = 1 gal.

8 qt. = 1 peck

4 pecks = 1 bushel

16 fluid oz. = 1 pt.

Linear Measure

12 in. = 1 ft.

3 ft. = 1 yd.

5,280 ft. = 1 mi.

State the time.



1. _____



2. _____



3. _____

4. 3 pt. = _____ cups
5. 4 tons = _____ lbs.
6. 7 ft. = _____ in.
7. 4 mi. = _____ ft.
8. 96 ft. = _____ yd.
9. 72 hr. = _____ days
10. 9 cwt. = _____ lb.
11. 64 oz. = _____ lb.
12. 3 pt. = _____ cups
13. 12 gal. = _____ qt.
14. 18 pt. = _____ qt.
15. 7 yr. = _____ mo.
16. 240 min. = _____ hr.
17. 32 qt. = _____ pecks
18. 48 fluid oz. = _____ pt.
19. 1,000 yrs. = _____ centuries
20. 20 weeks = _____ days
21. 10,560 ft. = _____ mi.

22. 5 qt. 2 pt.
-1 qt. 1 pt.

23. 2 lb. 9 oz.
+3 lb. 8 oz.

24. 7 hr. 42 min.
-5 hr. 50 min.

25. 4 pecks 6 qt.
+7 pecks 2 qt.

NIVEL 3/EXAMEN 2

Nombre _____ Fecha _____
 Profesor _____ Período _____
 Consejero _____ Calificación _____

Medidas de peso

16 oz. = 1 libra (lb.)
 100 lb. = 1 quintal (peso de cien lbs.)
 2000 lb. = 1 Tonelada (T)

Medidas de tiempo

60 segundos = 1 minuto (min.)
 60 min. = 1 hora (hr.)
 24 hr. = 1 día
 7 días = 1 semana
 12 meses = 1 año
 10 años = 1 década
 100 años = 1 siglo

Medidas para líquidos y para áridos

3 cucharillas = 1 cucharada
 16 cucharillas = 1 taza
 2 tazas = 1 pinta (pt.)
 2 pintas = 1 cuarto (c.)
 4 cuartos = 1 galón
 8 cuartos = 1 peck
 4 pecks = 1 bushel
 16 onzas fluidas = 1 pinta

Medidas de longitud

12 pulgadas (pulg.) = 1 pie (p.)
 3 pies = 1 yarda (yd.)
 5,280 pies = 1 milla (mi.)

Escribe la hora:



1. _____



2. _____



3. _____

4. pintas = _____ tazas
5. 64 oz. fl. = _____ pintas
6. 4 hr. = _____ min.
7. 12,000 lb. _____ toneladas
8. 4 galones = _____ cuartos
9. 12 yd. = _____ pies
10. 35 días = _____ semanas
11. 7 quintales = _____ libras
12. 4 tazas = _____ cucharadas
13. 3 mi. = _____ pies
14. 80 oz. = _____ lb.
15. 7 pecks = _____ cuartos
16. 4200 seg. = _____ min.
17. 12 días = _____ hr.
18. 48 meses = _____ años
19. 10 pintas = _____ cuartos
20. 48 pulgadas = _____ pies
21. 7 pies = _____ pulgadas

22. 6 galones 3 cuartos
-2 galones 2 cuartos

23. 7 lb. 10 oz.
+16 lb. 12 oz.

24. 5 semanas 6 días
+7 semanas 1 día

25. 7 yd. 1 p.
-5 yd. 2 p.

LEVEL 3/TEST 2

Name _____ Date _____

Teacher _____ Period _____

Advisor _____ Score _____

Measures of Weight

16 oz. = 1 lb.

100 lb. = 1 hundredweight (cwt.)

2,000 lb. = 1 Ton (T)

Measures of Time

60 sec. = 1 min.

60 min. = 1 hr.

24 hr. = 1 day

7 days = 1 week

12 mo. = 1 year

10 yr. = 1 decade

100 yr. = 1 century

Liquid & Dry Measure

3 tsp. = 1 tbsp.

16 tbsp. = 1 cup

2 cups = 1 pint

2 pt. = 1 qt.

4 qt. = 1 gal.

8 qt. = 1 peck

4 pecks = 1 bushel

16 fluid oz. = 1 pt.

Linear Measure

12 in. = 1 ft.

3 ft. = 1 yd.

5,280 ft. = 1 mi.

State the time:



1. _____



2. _____



3. _____

4. 4 pints = cups
5. 64 fluids ounces = _____ pints
6. 4 hr. = _____ min.
7. 12,000 lb. = _____ ton
8. 4 gallons = _____ quarts
9. 12 yd. = _____ feet
10. 35 days = _____ weeks
11. 7 cwt. = _____ pounds
12. 4 cups = _____ tbsp.
13. 3 mi. = _____ ft.
14. 80 ounces = _____ lb.
15. 7 pecks = _____ qt.
16. 4,200 sec. = _____ min.
17. 12 days = _____ hr.
18. 48 mo. = _____ yr.
19. 10 pt. = _____ qt.
20. 48 in. = _____ in.
21. 7 ft. = _____ in.

22. 6 gal. 3 qt.
-2 gal. 2 qt.

23. 7 lb. 10 oz.
+16 lb. 12 oz.

24. 5 weeks 6 days
+7 weeks 1 day

25. 7 yd. 1 ft.
-5 yd. 2 ft.



DACBE

National Dissemination and **Assessment Center for Bilingual Education**

Please help us improve it!

This book is the result of the efforts of many people working at the Bilingual Materials Development Center, The Dissemination and Assessment Center for Bilingual Education, Bilingual Resource Centers, local bilingual projects and bilingual teachers. This book has gone through a careful process of pilot testing and revision in order to give you the highest quality material possible. It is designed to meet your needs and those of your bilingual students.

The book will be revised on the second printing, in light of the feedback you and other teachers provide. These revisions will be based on your responses to the questionnaires inserted in this first edition.

The questionnaire covers the areas of Organization and Quality, Implementation, Content and tests. Please answer the questions as detailed as possible, providing comments and suggestions when applicable. If necessary add extra pages.

Once you have completed the questionnaire, tear the pages out of the book, attach any additional pages, fold them with the DACBE address on the outside and mail them (no postage is necessary).

WE NEED HELP FROM YOUR STUDENTS TOO!

Each of the students' books has two questionnaires inserted. One is in English and one is in Spanish. Please encourage your students to complete one, English or Spanish, whichever they prefer. You could make this a class project, getting the students to analyze the books and state what they like and dislike about them.

Thank you for your cooperation in this endeavor. Your help is essential for the improvement of bilingual education.

7703 North Lamar

Austin,

458-9131

Texas 78752

I. Organization & Quality

1. How well does the introduction in the teacher's guide explain how to use these materials?

- _____ 1 very well, no improvements are needed
_____ 2 acceptable, moderate improvements could be made
_____ 3 unacceptable, major improvements are needed

If improvements are needed, please describe:

2. How well do the teacher's and student's editions correspond?

- _____ 1 very well, class can be conducted with only the teacher's edition
_____ 2 adequate, occasional reference to student's edition is needed
_____ 3 inadequate, continuous reference to student's edition is needed

3. Did the lesson instructions provide sufficient information to implement the lesson?

- _____ 1 almost always
_____ 2 sometimes
_____ 3 almost never

4. How useful was the glossary in the student's book?

- _____ 1 very useful
_____ 2 somewhat useful
_____ 3 not very useful

II. Implementation

1. How difficult were these materials to use?

- _____ 1 difficult
_____ 2 average
_____ 3 easy

Comments: _____

2. How did you use these materials?

- _____ 1 group instruction
_____ 2 individual instruction
_____ 3 both, group and individual

Comments: _____

3. Was the number of exercises adequate for implementing the lessons?

_____ 1 yes

_____ 2 no

Comments: _____

4. Did you have to use additional materials to implement the lessons?

_____ 1 yes

_____ 2 no

Comments: _____

5. Are the materials adaptable for use with students of different ability levels?

_____ 1 yes

_____ 2 no

Comments: _____

6. How did you use these materials in your teaching?

_____ 1 basic text

_____ 2 supplementary

Comments: _____

III. Content

1. How do you rate the content of these materials in comparison with other materials?

_____ 1 excellent

_____ 2 above average

_____ 3 average

_____ 4 below average

_____ 5 poor

Comments: _____

2. Did the students benefit from using these materials?

_____ 1 yes

_____ 2 no -- Why not? _____

3. Did the students appear to be interested in the materials?

_____ 1 yes

_____ 2 no

Comments: _____

4. Is the reading level of the student books appropriate for most of the students in your class?

_____ 1 too difficult

_____ 2 about right

_____ 3 too easy

Comments: _____

5. Rate the difficulty level of the conceptual content of these materials.

_____ 1 much too difficult

_____ 2 too difficult

_____ 3 just about right

_____ 4 too easy

_____ 5 much too easy

Comments: _____

6. Do the materials cover the main topics of the subject curriculum?

_____ 1 yes

_____ 2 no--Which topics need to be included? _____

7. Were the main concepts of each lesson clear to the students?

_____ 1 yes, with no explanation from the teachers

_____ 2 yes, with minor explanation from the teacher

_____ 3 yes, with major explanation from the teacher

_____ 4 no

Comments: _____

8. Did the activities or exercises lead to concept mastery?

_____ 1 yes

_____ 2 no

Comments: _____

9. Did the sequence of topics facilitate learning?

- ☐ 1 yes
☐ 2 no

Comments: _____

10. Was the learning sequence well placed?

- ☐ 1 too fast
☐ 2 about right
☐ 3 too slow

Comments: _____

11. Do the activities lead to achieving the behavioral objectives given in each unit?

- ☐ 1 always
☐ 2 most of the time
☐ 3 sometimes
☐ 4 not very often
☐ 5 never

12. Were the behavioral objectives useful as a guide to your classroom presentation?

- ☐ 1 yes
☐ 2 no--Why not? _____

13. Were the criteria specified by the behavioral objectives appropriate for determining mastery of the content?

- ☐ 1 yes
☐ 2 no--Why not? _____

14. Was the number of behavioral objectives per lesson appropriate?

- ☐ 1 yes
☐ 2 no--Why not? _____

15. How much did these materials help the Spanish speaking students improve their English?

- ☐ 1 to a great extent
☐ 2 to some extent
☐ 3 to a small extent
☐ 4 not at all
☐ 5 not applicable

16. How much did these materials help the Spanish speaking students improve their Spanish?

- ☐ 1 to a great extent
- ☐ 2 to some extent
- ☐ 3 to a small extent
- ☐ 4 not at all
- ☐ 5 not applicable

17. How would you rate the Spanish competency level of these materials?

- ☐ 1 beginner (limited to no experience with Spanish)
- ☐ 2 intermediate (experience with Spanish but not fluent)
- ☐ 3 advanced (fluent in Spanish)

Comments: _____

18. Did these materials use Spanish that is understood by most Spanish speakers?

- ☐ 1 yes
- ☐ 2 no

Comments: _____

IV. Tests

1. Would it have been desirable to have a placement test for these materials?

- ☐ 1 yes
- ☐ 2 no

Comments: _____

2. Were the pretests helpful?

- ☐ 1 yes
- ☐ 2 no

Comments: _____

3. Were the posttests helpful?

- ☐ 1 yes
- ☐ 2 no

Comments: _____

4. What was the difficulty level of most of the tests?

- ☐ 1 too difficult
☐ 2 moderately difficult
☐ 3 just about right
☐ 4 moderately easy
☐ 5 too easy

Comments: _____

5. Were the test items clearly stated?

- ☐ 1 yes
☐ 2 no

Comments: _____

6. Were there any mistakes in the answer keys?

- ☐ 1 frequently
☐ 2 occasionally
☐ 3 never

Comments: _____

7. Was the length of most tests appropriate?

- ☐ 1 much too long
☐ 2 too long
☐ 3 just about right
☐ 4 too short
☐ 5 much too short

8. Were the tests given at appropriate intervals?

- ☐ 1 too frequently
☐ 2 about right
☐ 3 too infrequently

9. Are the test items representative of the content of the lessons?

- ☐ 1 yes
☐ 2 no

Comments: _____

If you have any other concern, comment or suggestion about the entire pilot testing procedure, the materials, student's reactions, etc., please provide them on a separate page.

FIRST CLASS
PERMIT NO. 3937
AUSTIN, TEXAS

BUSINESS REPLY MAIL
NO POSTAGE NECESSARY IF MAILED IN THE U.S.



POSTAGE WILL BE PAID BY

DISSEMINATION AND ASSESSMENT CENTER FOR BILINGUAL EDUCATION
7703 North Lamar Boulevard
Austin, Texas 78752